

DECEMBER, 1932
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Contractors and Engineers Monthly

Building a Bridge
over the Etowah River
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See page 24



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...unless there's long life in metal
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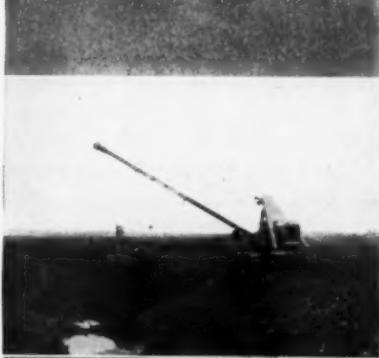
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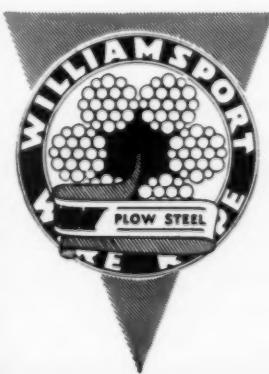
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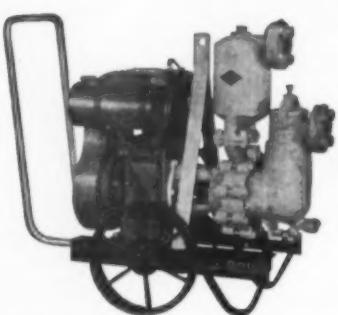
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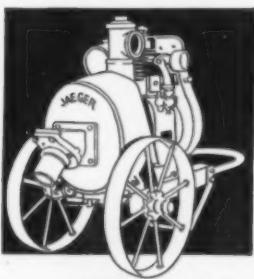
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The Moretrench Wellpoint System makes DRY ONES out of WET ONES, any time, anywhere, and under any condition.

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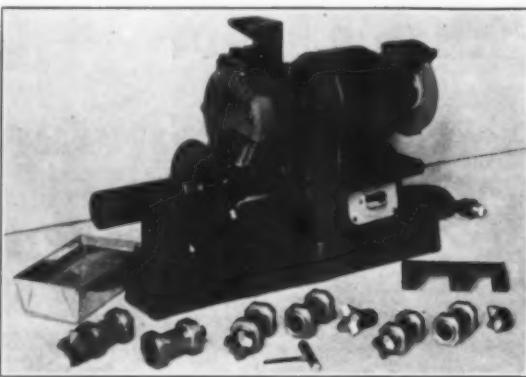
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May we send you information on this subject?

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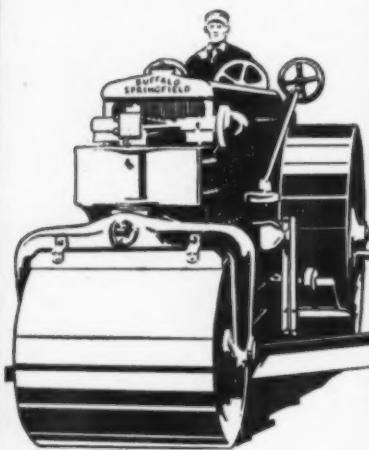
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Leadership is usually of short duration. Champions come and champions go in never-ending procession. Not so of the Buffalo-Springfield roller. It has held its rating as the premier roller for decades—is the leader today—will still be, we pledge you, the best roller a generation hence.

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This snapshot, recently taken at a popular New England summer resort (Watch Hill, R. I.), shows an ETNYRE 1500-gallon Model F Distributor applying seal coat on a bituminous macadam State Road Project.

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Other advantages:

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5 TONS
STRAIGHT
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POSITIVE
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Price \$75 F. O. B. Warehouse Points
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PULLSHOVELS—SKIMMERS—DRAGLINES
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Write for Bulletin No. 3210
giving complete information.

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*Carnegie Steel Sheet Piling in foundation
of Gulf Building, Pittsburgh*

FOR all types of foundation work, particularly where adjoining foundations and streets must be protected, walls of steel sheet piling are highly efficient. A wealth of experience in the use of piling makes the services of Carnegie engineers of real value to you in the solution of your problems. Feel free to take advantage of their services.



CARNEGIE Steel Sheet PILING

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by the Bucketful
from
**Contractors
and
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In these days of keen competition it
pays to know a little more than the
other fellow.

IS YOUR WORK ALONG ANY OF THESE LINES?



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IF SO—

You will find the experiences of others engaged on similar jobs helpful. CONTRACTORS AND ENGINEERS MONTHLY will keep you in touch with such jobs at a dollar a year! It takes only a few minutes to glance over the magazine for ideas—but it takes a LONG time to make up the losses on some tough job that didn't go through according to schedule, perhaps because of failure to check up on some of the "little things that count." Look CONTRACTORS AND ENGINEERS MONTHLY over each month for these "little things that count"—the little ideas on organization, equipment and methods that will cut your costs and increase your profits!

Contractors and Engineers Monthly
470 Fourth Ave., New York

Gentlemen: Please enter my subscription for one year at \$1.00 — (or three years at \$2.00 —).

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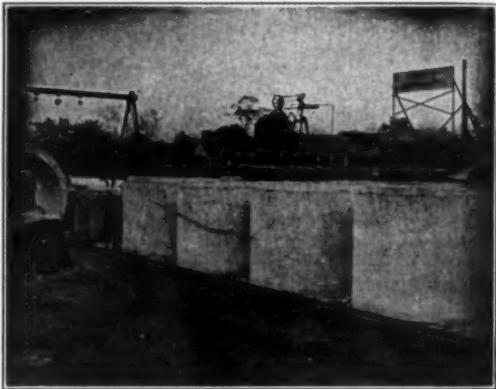
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Newark
REINFORCED CONCRETE PIPE
"It makes a better joint"

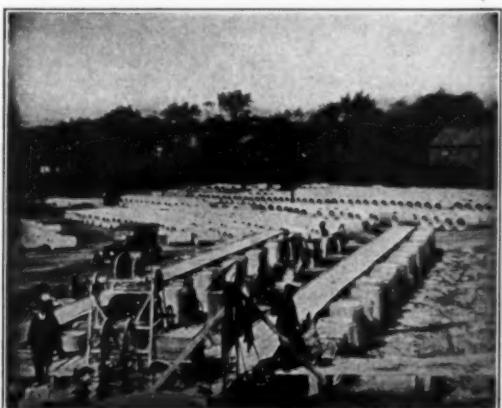
**Easily laid at
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with perfect
flow line.**



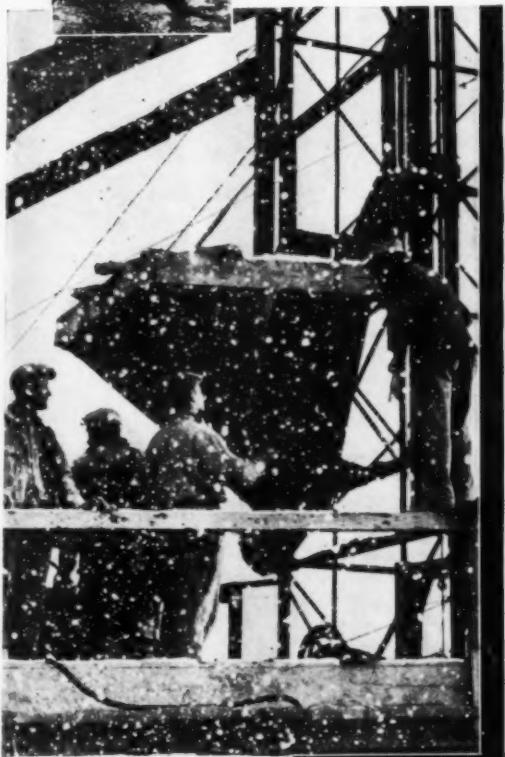
NEWARK CONCRETE PIPE COMPANY

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For Cold Weather Construction Put **CALCIUM CHLORIDE** In Every Mixer Batch



DON'T confine your use of Calcium Chloride to zero weather. You need it every day, in every batch, from autumn until spring.

Concrete hardens slowly when the thermometer goes down. Calcium Chloride accelerates the rate of hardening of concrete when used integrally. As a part of the mix it produces high early strength in the mass which is a definite factor in offsetting the effect of low temperatures.

Use your regular protective measures, of course, then take advantage of the additional protection of Calcium Chloride. It will permit earlier release of forms and equipment. It is an aid in continuous finishing.

Get full data now on the use of Calcium Chloride in concrete.

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RESERVE STAMINA!



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"Caterpillar" track-type Tractors are built to take the toughest assignments. That's why so many dirt-movers and road-builders rely exclusively on "Caterpillar" performance!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.
Track-type Tractors Combines Road Machinery
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Prices—f. o. b. Peoria, Illinois			
FIFTEEN	\$1100	THIRTY-FIVE	\$2400
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DIESEL			\$6500

CATERPILLAR
REG. U. S. PAT. OFF.
TRACTOR

During December we hope you will remember to mention CONTRACTOR'S AND ENGINEERS MONTHLY.

Belt Conveyor System

Builds

Levee Enlargement



New Method of Construction

Used by

Lynch Bros.

at Farrell, Miss.

HERE may be nothing new under the sun but there are always new applications of equipment of known value. A few years ago when Seattle, Wash., was performing its remarkable "from the mountain to the sea" movement and making for easier motor traffic through the city by eliminating one of the larger hills and at the same time creating a fine new waterfront area, belt conveyors did the trick. Believing that this same system might prove economical and satisfactory in levee building, Lynch Bros. of Chicago, Ill., placed a complete Link-Belt conveyor system on its job at Farrell, Miss. With this system a continuous stream of dirt was carried for a distance of 1,000 feet with one handling. Rehandling is the bane of the levee contractor's existence. If dirt must be handled more than once the price goes up and if the dirt is handled several times, it seems to have the faculty of disappearing.

OUTLINE OF THE SYSTEM

This system of levee construction consisted of a spreader conveyor mounted on crawlers and capable of turning the same as a dragline, to the hopper of which a stream of dirt was delivered from a conveyor on top of the levee. To this top system a series of conveyors of varying lengths carried dirt from two feeder conveyors which were placed in different positions to handle the material most expeditiously and over as wide an area as possible. The dirt was excavated by two draglines and dumped into the hoppers of two feeders which delivered the intermittent loads to the feeder conveyors as continuous streams of dirt.

The spreader unit consisted of a crawler-mounted body, free to swing in the same manner as a dragline and equipped with a 50-foot boom, carrying a 36-inch belt conveyor running at 500 feet per minute. This spreader delivered the dirt in a trajectory to any point within its radius. This dirt could be piled up for later spreading in thin layers with other equipment, but on this operation the dump foreman laid down the dirt so that the levee was complete as built except for the dressing with two 3-up mule teams and fresnos. All dressing was done on the day shift.

The top conveyor which was 200 feet long carried a 36-inch belt operating at 500 feet per minute. This conveyor was mounted on small flanged wheels running

on 20-pound rails and was propelled by a hand winch as it was necessary to move it along. The push button switch that operated the entire conveyor system was located at the head end of the top conveyor so that the foreman could stop and start the entire system instantly. The starting was handled through a system of relays so that each unit from the spreader back to the last loading hopper started a few seconds after the conveyor ahead to prevent piling up of the material. The last 25 feet of the top conveyor was cantilevered and rose at a slight angle to deliver the dirt in a projectory to the hopper of the spreader. This hopper was about 10 feet square.

The slope conveyor and the leader conveyor were identical in size, each being 100 feet long with 42-inch belts running at 350 feet per minute. These two provided very easily-handled flexible units which could be jack-knifed to take up any slack in the total distance of the end of the last feeder conveyor and the top conveyor. Thus they were operated either in a straight line as one extreme and at an acute angle to each other as the other extreme.

The two main conveyors were each 300 feet long and carried 42-inch belts running at 350 feet per minute. These conveyors, as with all others except the top conveyor and the spreader, were mounted on boiler head pans or skids like gigantic "domes of silence" rounded to slide readily over rough ground. For moving, the conveyor trusses were provided with $\frac{5}{8}$ -inch spreader cables at 20-foot intervals so that the draglines could pick them up and pull them easily either lengthways or sideways.

The two feeder conveyors were each 250 feet long with 42-inch belts running 250 feet per minute. To permit continuous feed of the intermittent loading of the draglines there were two feeder hoppers, one for each dragline, with an 8-foot square hopper having a manganese apron conveyor in the bottom operating at 175 feet per minute. The large lumps of sandy clay were readily broken down in these feeding hoppers and fed out to the feeder belts at a uniform rate so that the entire belt system carried a practically uniform load of dirt.

The two draglines which handled the dirt from the pit to the loading hoppers were Link-Belt machines, one a K-48 with a 45-foot boom and a 2-yard Omaha bucket and the other a K-44 with a 45-foot boom and a $1\frac{3}{4}$ -yard Omaha bucket. The K-48 was equipped with a Waukesha engine and the K-44 with an Atlas diesel engine. It is believed by the contractor that the draglines would have operated a little more efficiently on this system with shorter booms which would have permitted a faster swing. With the system as operated the draglines extended the pit to about 30 feet beyond the extreme end of the feeder conveyors. While the dirt went from dragline to hopper and thence from one conveyor to the next and finally into the levee, it was in reality handled but once as the system operated as one unit. Further, no dirt was lost on the way as the delivery from one conveyor to the next was so arranged with hoppers that there was practically no spillage. Occasionally a large lump of buckshot would roll off the conveyor, particularly the slope conveyor, but this was the exception rather than the rule.

ELECTRIC DRIVE THROUGHOUT

The conveyor system was driven by electric motors throughout. A total of 225 horsepower was required to operate the conveyors through a silent chain drive which required remarkably little maintenance in spite of the alternate mud and dust encountered. Electric power was purchased from the Mississippi Light & Power Co. at 440 volts, 50 cycles. A $1\frac{1}{2}$ -mile power line was required to carry the current to the job. The high power line was carried at 2,200 volts which was stepped down in a transformer at the power take-off. The transformer was mounted on skids so that it could be moved readily whenever the conveyor system was carried forward to build another 400-foot section of levee.

One of the secrets of the low power consumption of the system was the careful greasing of the idlers which carried $1\frac{1}{4}$ pounds of grease in the grease reservoir. This amount carried the system for six to eight weeks between greasings. The conveyors ran two 11-hour shifts, allowing 2 hours for greasing the equipment and going over the entire system for maintenance and adjustments.

LABOR ORGANIZATION

The labor organization required to operate any new system of dirt moving is always of interest for purposes of comparison with existing systems. The labor required for the conveyor system consisted of an operator and oiler on each dragline; one man who watched the two feeder hoppers; two men on the conveyors watching for large roots and any possible sticking of the buckshot in the hoppers; one boy picking out roots on one of the main conveyors, and then on top; a dump foreman who swung the spreader, a spotter who leveled off the humps and directed the Caterpillar Sixty and bulldozer in its work of finishing, and two track men for the top conveyor. There was in addition an expert electrician and the Superintendent. Another Link-Belt dragline, a K-30, also equipped with a Waukesha engine, worked ahead of the conveyor system making trackway for the top conveyor and doing other necessary work.

LIGHTING FOR NIGHT WORK

As this job was operated practically 24 hours a day it was necessary to have adequate illumination in the pits for the draglines and along the conveyors and at the dump on the levee. From two to four General Electric open-type floodlights with 1,000-watt lamps were used in the pits and four to 6 units with 250-watt lamps on the dump. No additional wiring was necessary as the power line was carried along the side of the conveyor trusses.

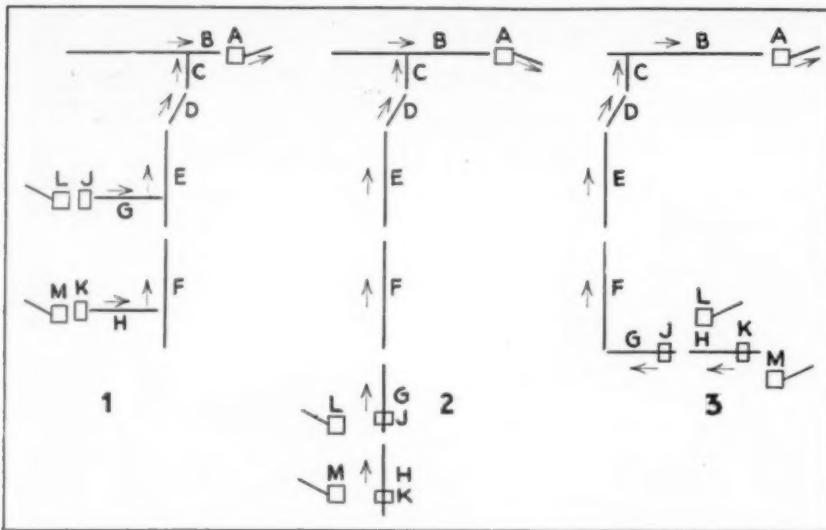
SEQUENCE OF OPERATIONS ON ONE SET-UP

The progress of the set-ups of the conveyor system is shown in the series of diagrams accompanying this article and these most clearly show the scheme behind the operation of the belt system. It was the endeavor of the operators always to handle the dirt forward to the spreader and thus when a move of the entire system was made the borrow pit was always even with the starting position of the top conveyor. This is shown in



HANDLING DIRT WITH DRAGLINES AND BELT CONVEYORS

1. Loading one of the hoppers at the extreme end of the conveyor system. 2. The loaded feeder belt at right angles to one of the main conveyors. 3. One of the main conveyors delivering to the leader conveyor and showing a slope conveyor in the foreground. 4. A distant view of the slope and top conveyors. 5. A close-up of the boiler head pans which permitted easy movement of the conveyors to new set-ups. 6. Night illumination was furnished by large and small electric floodlights.



Diagrams
of
Three
Set-Ups
of the
Conveyor Units
on the
Lynch Bros. Job

comparing the positions of the spreader and the drag-lines in all three diagrams.

DETAILS OF THE CONVEYOR UNITS

Unit	Length	Width	Speed per Minute
A—Spreader	50 feet	36-inch	500 feet
B—Top conveyor	200 feet	36-inch	500 feet
C—Slope conveyor	100 feet	42-inch	350 feet
D—Leader conveyor	100 feet	42-inch	350 feet
E—Main conveyor	300 feet	42-inch	350 feet
F—Main conveyor	300 feet	42-inch	350 feet
G—Feeder conveyor	250 feet	42-inch	250 feet
H—Feeder conveyor	250 feet	42-inch	250 feet
J—Feeding hopper	8 feet	8 feet	175 feet
K—Feeding hopper	8 feet	8 feet	175 feet
L—Dragline, Link-Belt No. K-48 with 45-foot boom and 2-yard Omaha bucket			
M—Dragline, Link-Belt No. K-44, with 45-foot boom and 1½-yard Omaha bucket			

Diagram 1 shows a normal set-up for starting the work with the slope conveyor feeding to the top con-

veyor near the delivery and the lead and slope conveyors at a slight angle to each other to carry the dirt around an obstruction. The two feeder conveyors were located to the left of the main conveyors, securing dirt at a maximum distance of 280 feet from the main conveyors. When the pit was excavated to the maximum depth allowed with this set-up, the next move was to extend the main conveyors by adding the two feeder conveyors to the end of the main conveyors, thus making it possible to load at a maximum distance of 1,330 feet from the center line of the top conveyor which rode the center line of the crown of the levee. Thus set-up is shown in Diagram 2.

The next extension of the system was to move the two feeder conveyors around at right angles to the



The Distributing Belt Conveyor Boom on the Dixie Construction Co. Job at Sherrard, Miss.

main conveyors and in the direction in which construction was progressing. This is shown in Diagram 3. It will be noted that the end of the last feeding conveyor was not permitted to extend beyond the point where the top conveyor delivered material to the levee. This was so that the system would always be self-supporting in so far as the material was concerned and not require the hauling of dirt to the feeding hoppers from a point beyond the reach of the draglines. The pits began at a point 400 feet from the toe of the levee and were dug on a 1-foot in 50 slope, making an average cut 6 feet in depth.

A fourth position of the conveyors, which is not shown in a diagram, was similar to that shown in Diagram 1 except with the feeder conveyors on the right instead of the left of the main conveyors.

PERSONNEL

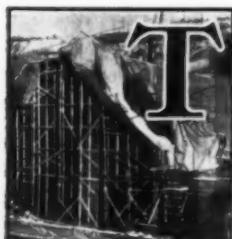
This contract for one mile of levee enlargement

amounting to about 650,000 yards of dirt was awarded to Joseph B. Turner of Birmingham, Ala., for 20 cents per yard. Lynch Bros. of Chicago, Ill., were subcontractors on this job. The contract was equipped and operated by the Link-Belt Co., of Chicago, Ill., with George W. Talbot as Superintendent in charge. For Lynch Bros. the work was under the direction of Leo Lynch, President, and James Lynch, Secretary and Treasurer. For the Memphis Engineer District, U. S. Engineer Corps, Major Brehon Somervell was in charge as District Engineer, with Burton Renager as Inspector in the field.

EDITOR'S NOTE: Since the Lynch Bros.' contract went in operation, another Link-Belt conveyor system has been put into service on the Dixie Construction Co.'s 1,200,000-yard levee contract at Sherrard, Miss. There are over 1,000 feet of belt conveyor in this unit, all track mounted for mobility. Material is dug by Link-Belt 2-yard draglines and fed to the belts by means of traveling grizzlies capable of breaking down lumps of buckshot if encountered. Delivery to any desired point in the levee is accomplished by means of a bridge-mounted swinging-boom belt conveyor. This system is handling the material in a continuous stream from the draglines at the borrow pit 1,000 feet away at the rate of 150 yards per hour. The distributing belt conveyor on this contract is shown in the illustration.

Winter Construction

Part III—Steel Construction



THROUGHOUT the twelve months of the year steel construction proceeds in all climates and in all latitudes. It is not found necessary to take any extraordinary precautions because of the varying seasons of the year, as steel can be erected any time, any where as long as men can work. This

has made possible remarkable progress in certain fields where such connecting links as viaducts have been constructed during the winter and were ready for concrete paving in the spring at the time work was undertaken on the road itself. In most structural steel work on buildings, the steel workers are afforded protection by the erection of wind breakers and the installation of salamanders to provide some heat within the structure to temper the cold. Every endeavor is made to carry brick work up as rapidly as possible within enclosures of canvas and frame construction, thus protecting carpenters and plasterers in their work.

In Illinois on a school structure the contractor reports

A Symposium Covering Expense,

Excavation and Grading,

Steel Construction,

Handling and Heating of

Aggregate

and Protection of

Concrete

that the work was stopped on all days unsuitable for steel work but that only about ten days were lost because of bad weather during the entire winter. An Iowa contractor who put through two river bridge spans in the winter where there was no chance to protect the labor was exceptionally fortunate in that the winter was unusually warm for that territory and consequently there was no suffering among the workers.

A Seattle, Wash., contractor working in Montana states, "We used two smudge pots between steel workers on the scaffolding. The men got so close to the pots when the temperature dropped to 10 degrees below zero that their trousers caught on fire."

Paving

Through the

Michigan Sand Dunes



EARLY 1,000,000 cubic yards of sand was moved by two subcontractors to clear the grade for 11.33 miles of the 18-mile concrete boulevard along the shore of Lake Michigan running south from South Haven. The grading was started October 15, 1930, and continued practically all

winter with some night work by one of the grading units. Gould & Cross, of Grand Rapids, Mich., worked by carbide flares set along the work at night as the hauls were not long. Their Northwest shovel was equipped with an electric plant and headlights, making the work as light as day for the operator. This same outfit also had three house wagons for its men lighted with a portable electric plant.

Pickett & Goodwin of Allegan, Mich., were also subcontractors on the grading. The third contractor on grading was Woodley Brothers, of Benton Harbor, Mich., who used Western crawler wagons and a P & H shovel. The shovels and hauling equipment which were used by the three subcontractors to rush this excavation through included a 10-yard Smith, an 8-yard Euclid, and a fleet of 5-yard Western crawler wagons, some five or six Koehring Dumptors and other equipment without crawler treads. The crawlers proved their value as every piece of machinery not so equipped was taken off the job.

There were, for excavating equipment, a P & H 1-yard shovel, four Northwest $\frac{3}{4}$ and 1-yard shovels, one Northwest crane with a 1-yard clamshell bucket, an Erie $\frac{3}{4}$ -yard steam shovel, and a Lorain $\frac{3}{4}$ -yard gas shovel. The steam shovel had two Freeman four-wheel-drive trucks and four Model A Ford trucks hauling from it and three Relay trucks hauled from the Lorain gas shovel. This outfit worked at the north end of the job where there was some earth and not a predominance of sand. The deepest cuts on the job toward the south end ran as high as 56 to 60 feet at the side with others of 40 and 50 feet, while the fills ran as high as 30 and 40 feet.

MUCK HOLES BLOWN OUT WITH DYNAMITE

All the muck holes on the job were treated similarly

to get rid of the unstable material. First a trench was shot along the line of the right of way and 20 feet to either side of the center line of the fill. A fill was then put in to about 7 feet above the final grade, 2-inch pipe was driven through the surcharge into the muck and two sticks of dynamite exploded to form a chamber. Then the hole was loaded with about 30 sticks and shot. The holes were spaced about 10 feet apart and were about 20 feet out from the center line of the fill. A well driller was used to drive the pipe, using a metal plug in the lower end of the pipe instead of the usual wood plug for this type of muck work. The metal plug cut through old logs and other obstructions where the wood plug would have simply splintered. The plug was shouldered to fit the end of the pipe, giving added strength to the driving end.

If the major blasting did not show satisfactory, a third drilling and blasting was resorted to with the surcharge carried about 5 feet above the finished grade. Throughout this work du Pont 50 per cent dynamite was used and the holes shot with a No. 3 du Pont blasting machine.

SEVERAL LARGE CULVERTS INSTALLED

There were a large number of small pipe and box culverts on this project but the three large 8 x 12-foot culverts required the major attention. These had 500, 900 and 1,300 cubic yards of concrete respectively. The largest of the three culverts was a twin barrel unit 178.9 feet long and on a 70-degree skew. It required 714 piles in the foundation, driven to depths of about 15 feet. There were 1,280 cubic yards of concrete and 245,000 pounds of steel. The culvert eventually carried a 30-foot fill.

TWELVE-CAR INDUSTRIAL RAILWAY TRAINS USED

All of the hauling for the paver was handled by 12-car trains on an industrial railway as the use of trucks would have been impossible. There were four locomotives for trains, two boosters and one for handling the cars of aggregate at the batcher plant. There were four old Burton gasoline locomotives, two Whitcombs, one Plymouth and one Milwaukee, all 7-ton units.

The track at the yard was divided with a siding switch and also two spurs leading to the repair shop and for storage. Another spur ran alongside the standard

Industrial Railway

Made Paving Possible

Through Loose Sand

Where Trucks Would Mire

gage railroad spur where the aggregate cars were spotted. When it was time to shift them one of the spare industrial locomotives was used with a steel cable to move the empty along and the next full car into place.

The yard was equipped with a blacksmith shop and a tool shop where most of the usual repair and overhauling jobs occurring on a construction job could be handled. There were a blacksmith and two mechanics in the yard for this type of work. They overhauled a Caterpillar tractor and made numerous repairs to the industrial equipment.

UNLOADING AND BATCHING THE AGGREGATES

During normal operation the batching plant handled about fifteen cars of aggregate a day. Both sand and gravel were shipped in by rail by the Grand Rapids Gravel Co. from Grand Rapids, Mich. The sand came in gondola cars and was clammed out by the Marion steam crane with a $\frac{3}{4}$ -yard Hayward bucket. Two men were kept in the cars to clean up by hand. The gravel was delivered in hopper-bottom cars and was emptied into a pit beneath the track and handled from

there by the same outfit to the wood bins over the four Johnson batchers or to the stockpiles. There were two batcher men, one for the two stone and one for the two sand batchers. The batches of aggregate for the 6-bag mix contained an average of 1,155 pounds of sand and 2,253 of gravel.

The 12-car trains with the locomotives at the far end ran through under the batchers and then spotted the pairs of boxes on each car under the twin batchers so that two boxes received the aggregate of like kind at the same time and the next pair the other aggregate at the same time. This minimized the loading of the trains which arrived at intervals of from fifteen to thirty minutes.

The locomotive then backed and carried the train to the cement dock where the cement crew had the six bags of cement for each box properly spotted and ready to empty. The cement was hauled out from the car by hand trucks and then opened and the sacks set up at the right spacing so that when the train came in and was spotted it was only necessary to step aboard the train and empty the sacks directly from the dock. There were six men in the cement dock and one man to bale the cement sacks that were tossed to the side opposite the dock as emptied.

As the only reliable means of communication between the plant and yard and the paver and grade was through the industrial railway all supplies for the road were carried out on the trains. During the hot weather one of the most important was the haulage of drinking water for the men. Three 5-gallon cans were carried back and forth continuously but still there never seemed to be quite as much water for the road gang as they wanted to drink. Gasoline for the paver and finishing machine were also hauled out by the industrial trains.

FINE GRADING IN FINE SAND

One of the customary pieces of equipment that is al-



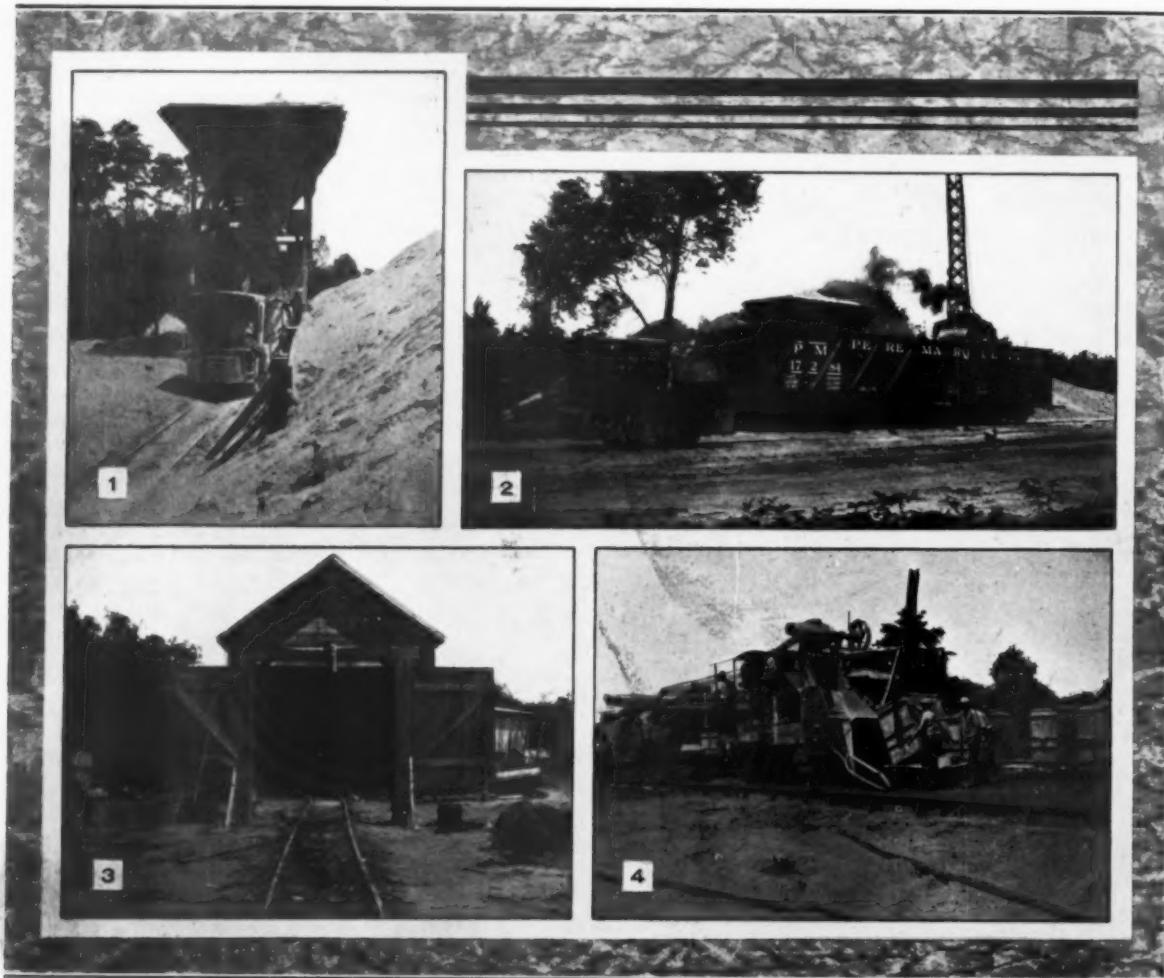
CONSTRUCTION OF A TWIN 12 x 8-FOOT BOX CULVERT BY BARDEN & WEST, SUBCONTRACTOR

The steel is shown in place, ready for the footings to be poured. Because of the size of this culvert the top and bottom slabs were divided into five sections. The photographs show the farthest section poured and bulkheads in place for the remaining sections. This culvert was poured with the Koehring 21-E paver shown.

ways looked for on the fine grade is the power roller. The puffing steam roller or its newer counterpart, the chugging gas roller, was entirely missing on this job for the sand was compacted solely by wetting down with a stream of water. The roller was used for a short stretch on the northern section of the job where there was some earth in the grade, and also to complete the shoulders which were made unusually wide because of the possibility of this road being widened later to a 40-foot pavement. The job carried a 4-foot shoulder of rolled $\frac{3}{4}$ -inch gravel for the entire length on both sides laid to a depth of 6 inches. In the sand section, which extended through most of the project, outside of the gravel shoulder was another of like width and thickness of clay and outside of that 2 inches of top soil carried out to the limits of the eventual 40-foot pavement. This protection was necessary, for any motor vehicles turning off the pavement onto the sand would have instantly been completely mired in the sand, as the Editor knows from sad experience on this job. This road running parallel to the shore of Lake Michigan,

and almost never more than one-quarter mile from it, is bound to be a popular one for the large and growing group of Illinois and Indiana bathers who come north in large numbers during the summer, many of whom are one day visitors, parking their cars just off the pavement and going to swim nearby. Without the effective shoulder protection this stretch would become a gold mine for the towing fraternity.

While we are discussing this phase of the work it is well to call attention to the remarkable fertility of the soil of this section which twenty years ago supported one of the finest groups of orchards in the entire country. The fine "blow sand" came in from the lake shore and smothered the entire section for a distance of 4 miles back from the lake. Thus this new road may restore the value of the land but in an entirely different way. To protect the road and the adjacent country where deep cuts have been made or fills piled up in the construction of this highway, all slopes were sodded, including the ditches. In 11.33 miles of right of way there were used 175,161 square yards of sod and 25,000



PLANT AND METHODS USED BY THE HERSEY GRAVEL CO. WHILE PAVING ALONG THE SHORES OF LAKE MICHIGAN

1. Loading a train of batch boxes at the batching plant. 2. One of the gasoline dinkies was used for shifting the aggregate cars. 3. The workshop where both gasoline locomotives and crawler tractors were overhauled. 4. Handling a batch box at the paver.

cubic yards of top soil.

On the fine grade ahead of the paver and after the heavy grading equipment of the subcontractors had completed their work, there were twenty men who also laid all the switches, track and water pipe lines. Of these, three men set the Blaw-Knox 8 and 9-inch steel forms for the 20-foot uniform section pavement. The remainder of the fine grade crew hand shoveled to or from the grade as shown necessary by the fine grade template which was pushed ahead as soon as the forms were set.

POURING CONCRETE IN SAND

As sand is most compact when wettest the only preparation of the grade immediately ahead of the paver was wetting down, a job which was handled in an excellent manner by the youngest member of the organization. There were three men handling the batch boxes from the cars and dumping them into the skip of the Rex 27-E paver. On the paver were the hoist man for the boxes and the paver operator. Two tail graders cared for the final grade by shoveling to and from the drag template pulled by the paver. There were four puddlers who also shoveled to the strike-off of the Ord finishing machine, two steel men who were permitted to walk into the concrete in setting the steel because of the "clean" nature of the soil on the grade, the finishing machine operator, and two hand finishers. These men used the two long-handled floats, the straight-edges, and a 14-inch canvas belt with an arched wood top to keep it taut. Following the finishers was a power machine for inserting the center strip with one man operating it. There were two burlap men who also edged the pavement, finished the transverse joints, and placed and sprinkled the burlap, and then four men covering the previous day's pour with sand and two men sprinkling.

This organization was responsible, under the able direction of the superintendent, for the pouring of an average of 900 feet of 20-foot pavement in 10½ hours daily.

THE WATER SUPPLY FOR THE PAVER AND FOR SPRINKLING

A Rex triplex pump and two C H & E triplex pumps of early vintage, but still performing to the complete satisfaction of the contractor, were used for the water supply of the job. As Lake Michigan was never more than one quarter of a mile away and there were a number of small streams running to it the problem of water was not a serious one. Realizing, however, that a breakdown in the supply line would prove very serious when water was the only thing that made paving possible through the wetting of the grade and for mixer operation, the contractor provided duplicate lines of 2-inch pipe throughout the work. One was used for the paver and the other for sprinkling. But in case of trouble with the paver line it could have been shifted on to the other line in a few minutes. Taps were inserted in both lines at intervals of 220 feet for the hose and the paver carried about 200 feet of Goodyear 2-inch hose.

RAPID WORK MADE POSSIBLE BY GOOD ORGANIZATION

Actual pouring of concrete was not started on this job until May 15, 1931, and the entire 18 miles of 20-

foot slab was completed by September. Soon after that date the shoulders, which were graded and graveled as soon as the pavement could be opened to traffic, were finished. The top soil was put on the shoulders between the gravel and the outside of the shoulders after the pavement was ready to drive on. The 28,290 feet of wire cable guard rail was installed complete. The sodding was done early in the season and some of the sod suffered from the dry spell during the latter part of June.

PERSONNEL

The Hersey Gravel Co., Hersey, Michigan, was the contractor for 11.33 miles of the 18-mile project, with Wilmer Pierson as Superintendent. The balance of the project was built by J. P. Scharl, Grand Rapids, Mich. The work was in charge of C. Coleman, Project Engineer, and R. A. Beers, Resident Engineer, for the State Highway Department of Michigan.

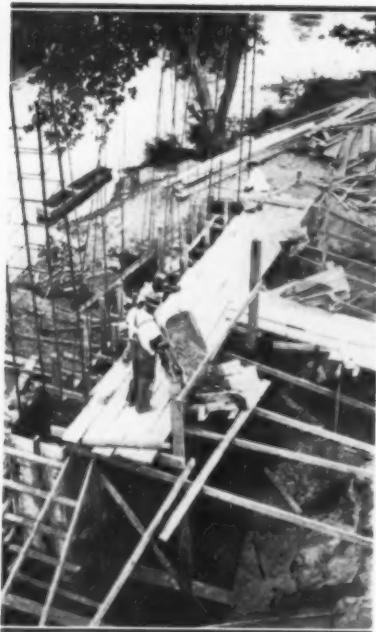
Maintaining 24-Hour Operation of Air Compressors

WHEN the Wenzel & Henoch Construction Co., of Milwaukee, Wis., began operation on the new water tunnel they are now building to connect the Swift and Ware Rivers as a part of the Metropolitan Water Supply System for Greater Boston, Mass., they were faced with the problem of keeping the air compressors used on the project in continuous operation 24 hours daily. The tunnel, when completed, will be 54,000 feet long and 15 feet in diameter. To speed operations, four vertical shafts were sunk and operations started from these points.

An important part of the equipment of each of these shafts is a battery of three Sullivan double-acting, single-cylinder air compressors, each with a rated capacity of 800 cubic feet per minute. Because of the large amount of fine dust gravel handled at each shaft, considerable apprehension was felt as to the abrasive effect the dust and grit filling the air around the compressor intakes would have on the finely polished cylinder walls and pistons of the air compressors. Because of this, each air compressor was equipped with a Coppus-Annis dry felt filter unit of 880 cubic feet capacity which was installed in a weatherproof housing on the compressor intake pipe. The installation has been in operation for more than five months, during which time in excess of 150,000,000 cubic feet of air has been filtered without any attention having been required for the compressors or filters.



A Dry-Felt Type Filter Unit Was Installed in a Weatherproof Housing on Each Compressor Intake Pipe



The
Etowah River
Bridge
at
Canton, Ga.

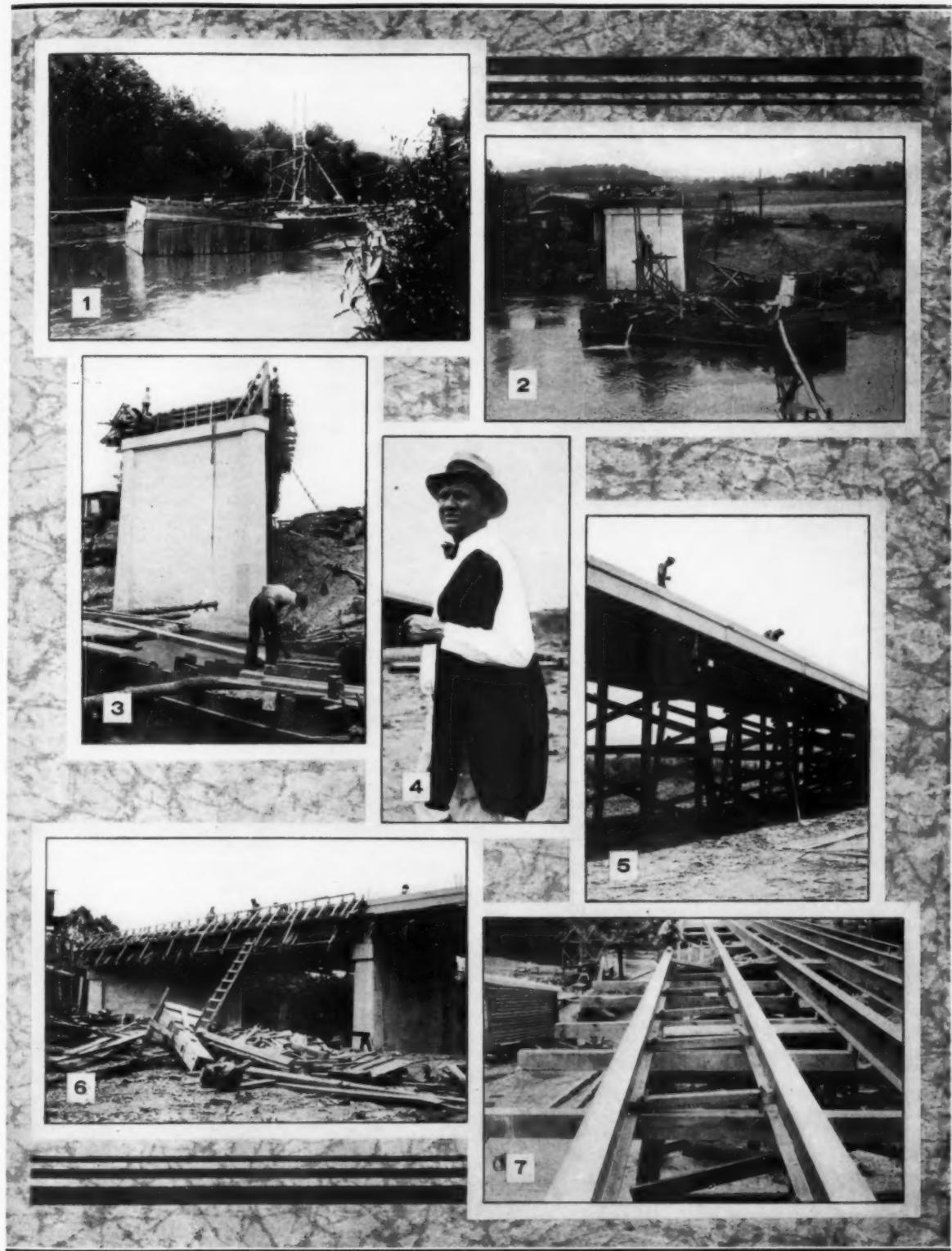
THE new concrete bridge over the Etowah River at Canton, Ga., is one of the longer bridge structures in northwest Georgia. It is 855 feet long with pile bents for the approach structures and I-beam girders supporting the concrete deck and cantilevered curb and hand rail. The spans vary from 20 to 90 feet in length, the shorter spans being for the approach and the longest across the river. The first five spans from the south are 20 feet, then one of 22 feet followed by one of 50 feet 6 inches, one of 60 feet, the long 90-foot span over the river, another of 60 feet, one of 50 feet 6 inches, one of 22 feet and then twenty of 20-foot span on the north approach.

Work on this structure was started on January 10, 1932, with the driving of test piles to determine the length of the piles which must be ordered to carry the structure. The State Highway Department furnished a series of borings along the center line of the structure but they also permitted the contractor to make the tests on force account to be certain of the lengths for the bents. The actual work of driving the pile bents for the structure began at the north end of the bridge with the driving of 40-foot creosoted piles with a 2,400-pound drop hammer in a 45-foot lead and handled by a 2-drum hoist driven by a LeRoi engine. All of the piles for the bents from No. 12 to 33 on the north approach were driven first, four piles to a bent with the two outer piles driven on a batter of $1\frac{1}{2}$ inches in 12 inches. Then a two-man hand saw was used to cut them to grade. The bents were capped with 12 x 12-inch x 21-foot timber cut to a 2-inch crown. Before the caps were placed, each of the piles was topped with a sheet of galvanized iron. The six pieces of sway bracing for each bent consisted of 3 x 10-inch creosoted planking

*Details of Methods
Used by
the Contractor,
Howerton & Hageman, Inc.,
of Asheville, N. C.*

from 24 to 26 feet long attached to the piles with $\frac{5}{8}$ -inch belts and two 60d nails.

The next work was the erection of the I-beam girders which were 40 feet long for the 20-foot spans so that they extended over three bents. This permitted an expansion joint at alternate bents. The girders were not encased with concrete but had concrete spacers 8 inches thick poured between each pair of beams reinforced with $\frac{5}{8}$ -inch deformed bars carried through holes in the girders and carried through the entire width of the bridge structure and bent up into the cantilevered bracket at the outside. These web spacers did not extend the full depth of the beams and were poured before the deck. The outer girders were 18-inch, 47-pound I-beams and the inner beams, all spaced 3 feet 10 inches, were 16-inch, 40-pound I-beams. They were set with the same hoist that was used for the pile driver, using a gin pole, and the hoist was moved along on skids as needed. A steel plate was set between each



DETAILS OF BRIDGE CONSTRUCTION IN NORTHWESTERN GEORGIA

1. The cofferdam for the river pier looked much like a scow headed upstream. 2. Another view of the cofferdam showing the pump discharge and the stage of work on the north bank. 3. The north bank pier as seen from the cofferdam. 4. A. M. Dietz, Superintendent of Construction for the contractor. 5. The crooked pile bents of the north approach. 6. The end span of the north approach showing the form work. 7. The method of supporting the deck forms from the I-beam girders.

creosoted cap and the I-beam girders. A $\frac{3}{4}$ -inch pre-moulded expansion joint was inserted between the ends of each pair of I-beam girders and web spacers.

THE CONCRETE PLANT AND FORMS

The concrete plant for the north approach, which was moved to the south bank of the river for the later work on that side, consisted of a 2-bag Jaeger mixer with a LeRoi engine and two Johnson Junior batch scales mounted on three legs, two of which had wheels so that they could be moved around readily at the stockpile and permit the wheelbarrows to be placed beneath to receive the weighed batch of stone or sand. Water for the concrete work was supplied from the river by a Domestic triplex road pump. The aggregate used for the concrete was marble, not for any decorative effect, but because it was the cheapest acceptable stone that could be purchased locally. Class A stone was used, varying from $1\frac{1}{2}$ -inch down to $\frac{1}{4}$ -inch screen size. The batches for the 2-bag mixer were made up of 666 pounds of stone and 424 pounds of sand with 2 bags of cement. The concrete crew consisted of two men shoveling stone, two men wheeling the stone, one man shoveling sand, one man wheeling sand, one mixer man, and from two to four men wheeling the concrete in buggies, depending on the length of haul. The concrete was given a full $1\frac{1}{2}$ -minute mix.

There were four carpenters on the form work. The deck forms were made up of 1 x 6-inch shiplap. On the curbs the forms were tied with wire. For the curbs one set of forms for pouring about 60 feet of curb was made up in 20-foot panels and used repeatedly. The forms were poured one day and pulled the next morning. The outer curb forms had 1 x 4-inch horizontal wales and 2 x 4-inch vertical struts. Diagonal braces carried out to cantilevered 6 x 8-inch timbers supporting horizontal pieces were used and consisted of scrap lumber. Concrete block spacers were used measuring $1\frac{1}{2}$ x $1\frac{3}{4}$ inch by the width of the wall. These had a single piece of No. 8 wire centered in them and did away with removing rods or wires and wood blocks which sometimes are forgotten when the men are pouring and have to be bored out of the completed structure.

The concrete spacers and blocks for supporting the reinforcing for the deck were cast in gang molds on the floor of the bridge. The wooden molds were simply long boxes the required depth and width to give the sizes needed. When the initial set was about complete the blocks were cut to the required width with a mason's trowel in the familiar way in which candy is marked in the cooling pan. About 200 spacers and blocks were cast at one time from a single batch of concrete.

CANTILEVERING THE CURB FORMS

As mentioned above, the curb forms were cantilevered out from the structure. This was done in a novel manner that is worthy of mention. A cage of scrap lumber was made that fitted over two of the outer I-beams. Within this a block and tackle was rigged and one man moved it along the beams as required. Two men below attached and pulled up 12-foot lengths of 6 x 8's. These were properly blocked to fit the bottoms of the girders bearing on the caps which had a crown of 2 inches. The 6 x 8's were held in place

against the bottoms of the I-beams by two bolts run through a 4 x 4 set on the bottom flange of the two outer I-beams. In this way a cantilevered support was provided for the scaffold for the carpenters, and for the braces of the curb forms.

The reinforcing steel for the structure was received from the Kalman Steel Corp. through its Atlanta branch all bent, bundled and tagged for use. The steel men used 10d nails for tying the reinforcing steel with No. 16 wire. No special ties were used and the nails were always quickly replaceable if lost.

CONCRETING PROCEDURE

The contractor poured one-half of the length of a 40-foot girder at one time. At the end of each 40-foot girder, an expansion joint was left and at the mid point over the intermediate bent a dummy joint was left to localize any crack caused by deflection. The bents were poured alternately. No steel was carried over an expansion or dummy joint. At the dummy joints the concrete was edged about $\frac{3}{4}$ -inch deep.

The concrete hand rail was poured on the deck in groups of forms when a section of the deck farther along was being poured. In this manner there was no added expense for running the mixer just for the hand rails. These rails measured 4 x 7 inches in section and about 10 feet long, depending on the slightly varying length of the spacing of the posts. Four deformed bars were left when the curb was poured so that the posts would be tied in to the curb when poured. The hand rails were removed from the molds the day after pouring and cured on the deck in the same way as the deck itself by covering with sawdust. The contractor reported this as the best method he had tried for curing concrete decks and the incidental concrete such as the hand rails. The sawdust holds the moisture for a long time and the daily wetting down of the concrete covering material is greatly lessened.

When pouring a slab or section of the deck 4 x 6-foot platforms with four legs were set in the forms without interfering with the reinforcing and made a continuation of the wood track which was laid on the deck sections already poured. This track was made of 1 x 8-inch lumber and protected the deck from any marring by the steel wheels of the concrete buggies. The specifications required that the deck be protected from any conveyances for a certain period. The contractor poured four 20-foot spans a week, and could have raised this to six but other circumstances over which he had no control made it advisable to reduce the number of laborers and hold the crew to four spans a week.

The location was ideal for a contractor's work. The country around the bridge was flat, making it possible for him to use the ground at one side of the structure as storage for reinforcing steel and lumber and the other for sheds, office and several shacks for negro labor that lived on the job.

The typical bridge builder's deck was missing from this job as the contractor used a 23-foot screed for floating the 20-foot sections of the deck and thus eliminated the rough riding features of the usual bridge on which the riding slab is not poured and finished by a road contractor. The screed was made of three pieces of 2 x 12-inch lumber bolted together and shod with a

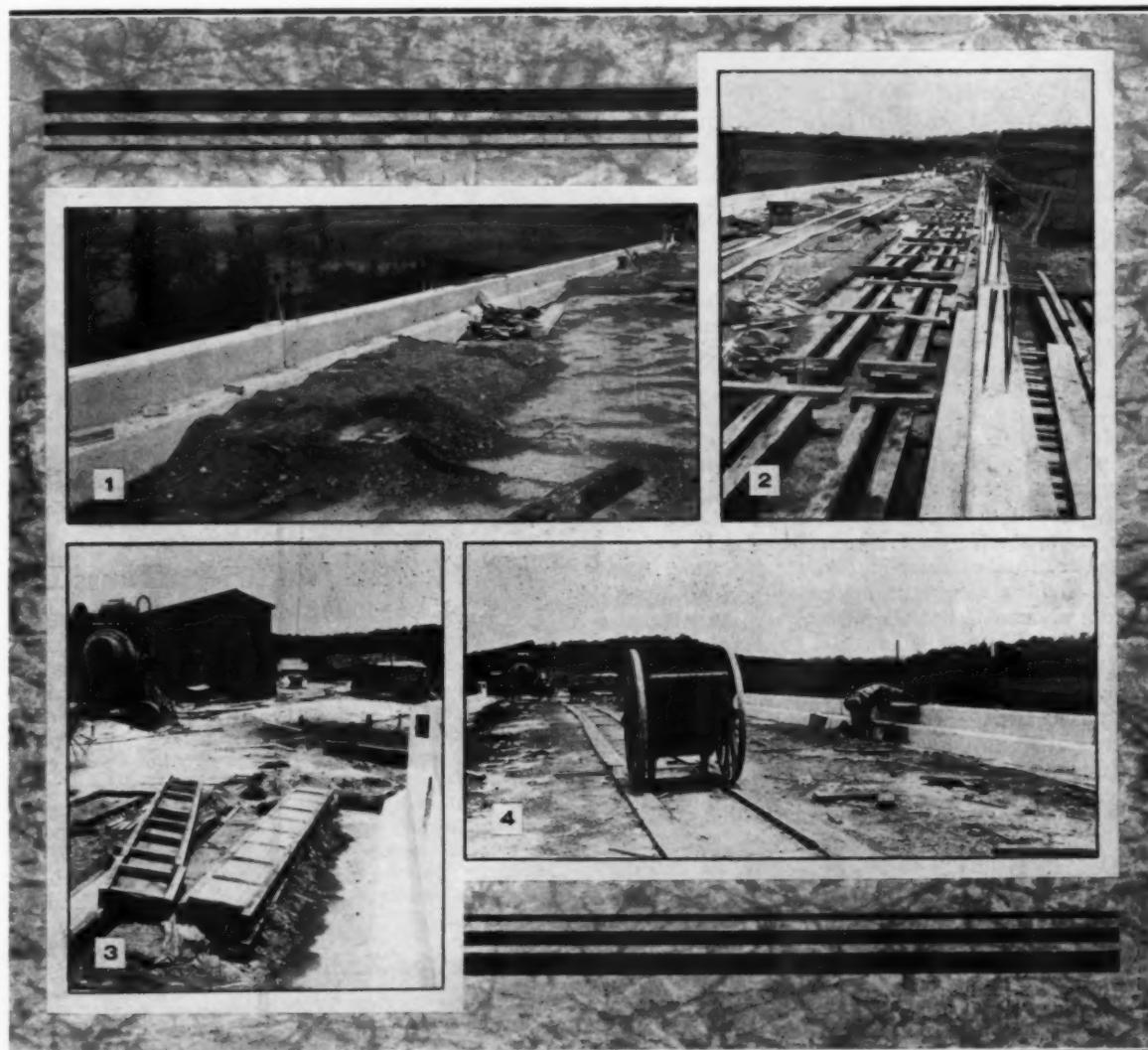
6-inch channel iron. It had heavy iron rod handles at each hand for the men operating it to use in pulling it back and forth. One man was used at each end as with the "bull-float" of the road builder. The specifications allowed 1/16-inch variation in the surface of the deck in 10 feet. If any, even as much as that, were found the contractor of his own volition used the carborundum bricks to remove them.

In finishing the curb and hand rail the carborundum bricks were used three times, first when the forms were stripped, second after they had hardened and then the final rubbing after they were completed to take off any sandy surface that might have been left from previous finishing and plastering. All of the rubbing was done by hand as the contractor's experience had been that machine rubbing requires more skilled labor to get the best results in the quickest manner without the damage that will come from careless operation, particularly in green concrete.

CONSTRUCTION OF THE RIVER PIERS

The excavation and construction of the river piers was awarded to W. H. Holz of Atlanta, Ga., by subcontract. There were two river piers, each with 6 x 6-foot footings of varying depth and with two columns to the pier. The footings were carried from 1 foot below low water to rock. A 15-inch web wall was poured between the two columns which were 14 feet between footings. The columns were 2 feet 6 inches square in section at the top and battered with a 3-foot cap and riser blocks to take care of the different depth I-beams.

The first operation in the excavation for the river piers was the driving of the sheeting of the cofferdam. The inner sheeting measured about 20 x 40 feet in plan and consisted of 2 x 10-inch lumber 12 to 14 feet long. It was driven by hand and 8 x 8-inch wales were used spaced 4 feet vertically at the top and as close as 2 feet in the lower sections. About 1 1/2 feet inside the wood



SOME DETAILS OF CONCRETE CASTING AND FINISHING

1. Curing precast concrete hand rail in damp sawdust on the bridge deck. 2. Forms ready for pouring concrete hand rail. 3. Two gang molds for casting concrete spacers and blocks. 4. A wood track was laid to protect the bridge deck from possible damage by the metal wheels of the concrete carts. At the right, hand rubbing of the curb and hand rail base.

sheet piling the contractor placed his steel sheet piling with an 8-inch web which was driven by a steam hammer to the depth of the footing. There was a 4-foot puddle between the inner and outer wood sheet piling and only about $1\frac{1}{2}$ feet between the steel sheet piling and the forms which left a scant space for the various operations. The contractor handled the work well considering this handicap and the other far greater handicap of the failure of the rock to show up at the elevation that it should on the west side of the first river pier. The forms for the footings of the river pier were 1 x 8-inch rough lumber.

The footing excavation was carried down 12 feet to rock on the east side of Pier 10. But 14 feet to the west, where the other footing was located, he went down 23 feet and struck only a sandy rock which could be readily shoveled. Test piles 11 feet long were driven without striking rock or being driven to refusal. It was decided by the state engineers to make the west footing on a pile foundation, so 40-foot piles were driven using 10 piles for the 6 x 8-foot footing which was enlarged from the 6 x 6-foot footing because of the poor foundation. Untreated pine piles with 12-inch butts and 8-inch tips were used.

For unwatering the cofferdam the subcontractor used four Pulsometers, but with an inadequate steam plant he was unable to dewater the pit faster than the water ran in, so a 4-inch self-priming Domestic centrifugal pump was installed and with this, the water was handled successfully.

The subcontractor operated a concrete plant consisting of a Ransome 2-bag mixer and Fairbanks wheelbarrow scales for weighing the aggregates for the batches.

PERSONNEL

Except for the delays caused by the unusual rock conditions in the river which delayed the subcontractor in the completion of the river piers, the entire structure would have been completed by the middle of June, 1932. Instead the work was held up for another month. The contractor for the bridge proper was Howerton & Hageman, Inc., of Asheville, N. C., for whom A. M. Dietz, who has a financial interest in the company, was Superintendent. The subcontractor on the river piers was W. H. Holz of Atlanta, Ga. The extensions of the west footing for the river pier was done on force account because the footing was made larger in plan and was carried deeper and required the additional construction both in the cofferdam and in the piling. For the Georgia State Highway Department, Willis Wells was Resident Engineer.

Concrete Curing on the Tunnels at Hoover Dam

In an article on the construction of the diversion tunnels at Hoover Dam which appeared in the November issue of CONTRACTORS AND ENGINEERS MONTHLY, it was stated that the curing process was by means of sprinkling. Although this was the method first used, a change was made later and the Hunt process of curing was substituted for sprinkling. The Hunt process, which is a bituminous compound of native asphalts together with a fixed carbon and fluxed with a volatile solvent, was applied through two air guns to the fresh concrete immediately after the lining jumbos were moved forward.

Contracts Let for Bridge Over St. Lawrence River

THE Lake St. Louis Bridge Corp. has announced the awarding of contracts for the construction of the Lachine-Caughnawaga Bridge over the St. Lawrence River. The new span from Montreal to the south shore will be erected at a cost of \$2,559,243, with A. Janin & Co., Ltd., of Montreal undertaking the work on the piers, approaches and concrete work at a price of \$1,786,000 and the Dominion Bridge Co., Ltd., Montreal, the erection of the superstructure at \$773,243. The bridge is to be completed and open to traffic by May 1, 1935. The work of the Janin firm is to start immediately and will be carried on throughout the winter with from 150 to 300 men engaged in construction activities.

The St. Lawrence River is approximately $\frac{5}{8}$ -mile wide at the point where the new highway bridge will add another traffic entrance to Greater Montreal and will also facilitate international traffic to and from the United States. The bridge is being erected from Ville La Salle, near Lachine, to the Indian Reservation at Caughnawaga on the south shore, about 6 miles west of the center of Montreal and at the foot of Lake St. Louis.



Floating One of the 425-Ton Bridge Trusses Into Position

Hoisting a 425-Ton Bridge Truss Into Position in Holland

BUSY railroad traffic necessitated the erection of a second railroad bridge at Zalt Bommel, Holland. The new bridge was erected adjacent to the existing one and consists of three 413-foot through truss spans besides eight 171-foot approach spans of the through type. The 260-ton approach spans were floated to the bridge site, a distance of 59 miles and jacked into position. The erection of the main spans is done by raising the 425-ton trusses into position with floating derricks provided with gallow frames, as shown in the illustration. The approach spans are fabricated and erected by the firm De Schelde, Flushing, Holland. The fabrication and erection of the main spans is being carried out by Werkspoor, Amsterdam, Holland.

Landscape Architects for Golf Course Property

WE are informed that the firm of Olmsted Brothers, Brookline, Mass., was retained as landscape architects at the beginning of the work on the property of the Augusta National Golf Course, Augusta, Ga., and is still so retained. We regret that this fact was not mentioned in the original article published in the October issue of CONTRACTORS AND ENGINEERS MONTHLY.

How the Other Fellow Did It

Construction Briefs

Paint for Maintenance and for Checking

191. "Save the surface and you save all" is the slogan of the paint manufacturers and it is an exceedingly important slogan for contractors to remember. Well painted equipment lasts longer than that which is permitted to rust or rot without the preservative coat of paint. A Wisconsin contractor whose job we visited had an idea other than merely maintenance when he painted his equipment a distinctive blue. He had a lot of hired trucks on the job and some of the work was being done by subcontract. The blue of the contractor's own equipment showed just where it was at any time on the job. Just enough contractor-owned trucks were scattered throughout the hauling both on the grade and on the batches to set the pace for the hired trucks. With stop watch in hand, the contractor was sure that his own trucks were setting the pace properly.

Olive drab may be a good color to blend with the landscape but it is lots better to know that the flame red, bright yellow or distinctive blue spot on the landscape is your piece of equipment and that it is moving.

23.4.63

Intermittent Instead of Continuous Feed to Asphalt Spreader Box

192. On most asphalt jobs where hot mix is hauled from the plant to the road and the layers spread down with spreader boxes, the truck bodies are raised and the hot-mix material permitted to slide into the box at the same time the truck pulls ahead. This is usually done continuously but on one job where the spreader boxes were perhaps a little larger than usual, the superintendent instructed the spreader men and truck men to dump approximately half the load of the trucks into the spreader box, then to pull ahead until the box was nearly empty, then dump the remainder of the material into the spreader box and pull ahead until it was nearly empty again. The superintendent explained that he secured better results and more continuous operation by this method. The one great advantage is that the box men could watch the flow of material from the box on to the road and regulate the feed door as necessary instead of having to keep one eye apiece on the tail board of the truck lest the material flow in too slowly or too rapidly.

23.2.68

Belt Conveyors Feed Crusher

193. An Ontario contractor planned an interesting layout to secure maximum production in his gravel pits with a minimum of labor and equipment. The pits contained a large amount of oversize stone which necessitated crushing. The 14 x 24-inch jaw crusher was set up at a convenient point with two 100-foot 24-inch belt conveyors running to it at an angle of about 150 degrees. The belts were operated alternately and were fed by a $\frac{3}{4}$ -yard steam shovel operating against a gravel bank about 50 feet high. The shovel loaded to a steel hopper with a control gate in the bottom to spread the load evenly on the belt. The belt delivered to the top of a sloping bar grizzly over the boot of a bucket elevator which took the proper size material to the screen. Oversize went direct to the crusher which delivered the crushed material to the bucket elevator. When the shovel had worked as far as possible around one belt conveyor, it picked up the steel hopper and worked its way around to the other belt. During its operation with the second belt, the first was moved to a new location.

23.4.69

Spotting the Trucks at the Batcher

194. "Hey, move back a little. No, that's too much. Hold it." That is a monologue of the weigh-man at many batching plants when the trucks back in for their loads. A contractor in western Iowa overcame this and consequently removed considerable possible friction between the weigh-man and the truck driver by merely hanging a metal ring about 3 inches in diameter at the proper distance from the front of the batcher at a point where the tail gates of the trucks should be spotted to drop the batch properly. As all the trucks were one-batch units they were about the same length and one setting of the weight was sufficient for the entire fleet of twenty-four trucks which did the batch hauling by subcontract.

23.4.44

Cement Handlers Helped Inspector Check

195. There is no contractor today with any idea of responsibility who will deliberately cheat in the number of bags of cement put into a batch of concrete. The old days when a contractor tried to get his profit out of the cement he did not use are gone. It is, however, more important today than ever that the correct amount of cement be added to each batch. In order to insure this, the contractor takes every precaution possible to see that six, seven or eight bags of cement go into each batch, and in addition the state usually places an inspector on the job as a final check on the number of bags to insure the strength of concrete. On an Illinois job, where batch boxes on industrial railway cars were used to haul the aggregates and cement to the paver, a visual check was maintained on the number of bags of cement dumped into each batch box. Four men under contract handled the cement at the dock from the railway cars. They used hand trucks to bring out six bags of cement per load and then spotted the piles along the dock edge ready for the industrial railway train. Each man as he emptied the bags into the boxes tossed the empty bag over the edge of the box so that at any time the actual number of bags that had been emptied could be checked. As soon as the six bags had been emptied into any one batch box, the bags were tossed off to the far side together and then picked up by another man and baled.

23.4.52

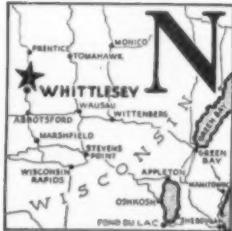
Rivets, Fence Posts and Stumps

196. One might ask what have rivets, fence posts and stumps to do with novel ideas and aids to construction. It happened that a contractor in Illinois was running a 12-car industrial railway train with two batch boxes to the car and the problem of speeding up the loading of the batches was a serious one. First, to save time, the contractor built an aggregate bin capable of holding three cars of aggregate and equipped the bin with eight batchers, four for gravel and four for sand. The 12-car trains with two boxes to a car pulled into a switch on the road near the plant and exchanged for a full train. The yard locomotive then picked up the empty train and pulled by the cement platform to the batching plant. Here is where the rivets, fence posts and stumps acted as an aid to quick loading. The locomotive engineer was remarkably accurate in spotting the cars under the batchers without the aid of a brakeman. He had lines of rivets on some nearby gas tanks, some fence posts and two tree stumps spotted along the tracks which gave him the correct place to hold the locomotive for each pair of cars to be loaded. This greatly speeded the loading.

23.4.52

A

Different Organization around the Paver



OT completely satisfied with the initial method of handling the bulk cement from cars to the batch trucks, the McKenzie & Kileen organization changed the manner greatly in the second set-up for its 13-mile road job between Whittlesey and the Taylor County line on Wisconsin Route 13. The line-up around the paver was rather different from that usually used in handling 20-foot paving and presents an interesting study.

HANDLING THE AGGREGATES AND BULK CEMENT AT THE FIRST SET-UP

A siding of the Soo Line near the southern end of the job offered the first opportunity for the handling of the sand and gravel for the road. Both sand and gravel were shipped in by the Eau Claire Sand & Gravel Co. from its pits at Chippewa Falls, Wis., in gondola cars and were unloaded to stockpiles or to the bins direct by a P & H crane with a 45-foot boom and an Owen 1-yard clamshell bucket. Using only three sizes of aggregate it was possible to handle them with one crane very easily. The crane ran along a path between the siding and the two Johnson batching plants. Both were two-compartment bins, but one was used for the two sizes of stone and the other solely for sand.

Twelve cars of aggregate and cement could be accommodated on the siding at one time. The cars were spotted twice daily by the local freight and then moved by an American Hoist & Derrick hoist rigged with a bar and horse similar to the old method of moving houses through the city streets. A cable long enough to reach the entire length of the siding was used so that

*McKenzie & Kileen
of Minneapolis*

Changed

*Bulk Cement Methods
and
Had Unusual Grouping
in
Concrete Crew*

any car or group of cars could be moved at any time. The method was slow but effective. Usually two or three cement cars were spotted at the dead end of the siding. A total of eighteen cars of material were regularly unloaded each full working day. Two men cleaned up in the aggregate cars, and the only other men around the plant were the crane operator, the two batcher men and one man checking the hired trucks which were paid per batch hauled.

The cement dock, about 300 feet from the nearer batcher, was built to accommodate two cement cars at one time so that there would be no delay when one car was emptied. The original method of handling the cement was not entirely satisfactory to the superintendent but was continued during the use of the first location because of the difficulty in making the change during the progress of the work. The first dock was about 40 feet long, running from one freight car door to the next, and was 10 feet wide. Steel plates measuring 3 x 4 feet were used as gang planks between the cars and the dock. The beam scales for weighing the loaded buggies were located close to one freight car door, but at the outer edge of the dock.

There were four men shoveling into the cement buggies, one man wheeling, weighing and dumping and another man on the trucks covering the cement with sand.

This was later changed to two men shoveling and two wheeling with the extra man dumping. There were two separate drop platforms or traps which were let down onto the sides of the trucks, with blocks on them so that when the buggies were wheeled out the blocks stopped the forward progress and helped dump the batch. The traps were counter-balanced with scrap iron and the man who covered had to raise and lower them for each truck.

All hauling of batches was done by subcontract by Volck Bros., of Bruce, Wis., using one and two-batch International trucks. In order to use the traps at the first bulk cement dock it was necessary to build up the right side of the body to meet the elevation of the trap when dropped as the truck body was relied upon to furnish the support at the end away from the dock.

The average batch hauled by the trucks was 1,554 pounds of coarse gravel, 1,038 pounds of pea gravel and 1,543 pounds of sand for the 630 pounds of cement to produce a 33-cubic foot batch of mixed concrete.

PREPARING THE GRADE

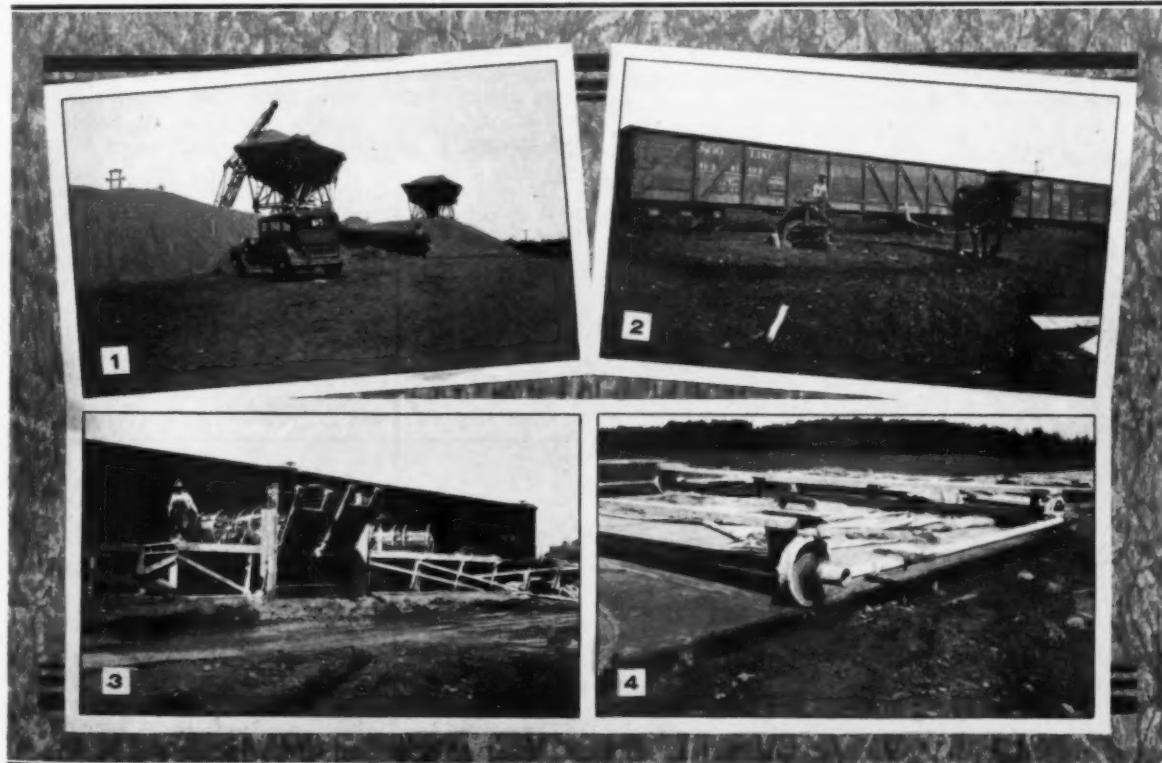
The fine grade was prepared well ahead of the paver, and the forms usually between 500 and 1,000 feet ahead of the concrete at all times. There were three men setting the 9-inch Blaw-Knox steel forms after the trench had been cut with a Carr Formgrader. A Caterpillar Thirty pulled a Carr scarifier and a Euclid rotary scraper, and a second Thirty handled the Carr subgrader

and scarifier. A Wehr one man grader and a Wehr roller were used effectively in the final preparation of the fine grade. Four men with shovels followed up the sub-grader and trimmed the grade. One man tamped the forms to insure a firm foundation for the finishing machine. Another handled the oiling of the forms and assisted with the setting of the bulkheads for the 1-inch expansion joints which were poured, and helped with the steel when fabric mesh was being used over soft spots in the grade and at the approaches to bridges and over all culverts. One man handled the Freeman turntable and another man took care of the dumping of the batches as the trucks arrived at the skip of the Rex 27-E paver.

THE CREW BACK OF THE PAVER

The paver pulled a Carr subgrade planer and two tail graders shoveled the excess dirt out to the shoulder. Two men placed the steel dowels, $\frac{1}{2}$ -inch by 4 feet, spaced 2 feet apart, across the continuous longitudinal center slot, and ten dowels across every plane of weakness at 30-foot intervals with metal sleeves on one end of each dowel to permit freedom of movement. These two men also placed the joint boards for the poured joints. There were three puddlers and one spader who handled the spading against the forms on both sides of the slab.

The Ord finisher operator and a helper placed the transverse slots from the finisher, using a hand cutter



SCENES ON A 12-MILE PAVING PROJECT BETWEEN WHITTLESEY AND THE TAYLOR COUNTY LINE, WIS.

1. One crane served the two batching plants running along a path between the siding and the bins.
2. "Old Dobbin" and the capstan moved one or all the aggregate cars on the siding.
3. The cement dock showing the dual traps.
4. One end of the "bull-float" bridge showing its pipe construction and its rests for the float.

to make the slot for the oiled metal wedges. The two men on the 10-foot longitudinal float, which was worked from a twin rolling bridge made with a pipe frame and a wood top and racks to hold the float while not in use, placed the continuous center strip. A four-wheel bridge with all the necessary equipment for installing the transverse joints was attached to the finishing machine by a metal frame about 4 feet long. The "bull-float" men also used the two canvas belts and straight-edged the pavement and edged the slab. Behind them came two more men with another rolling bridge who pulled and edged the center and transverse joints and pulled the expansion joint bulkheads.

The burlap was carried neatly spread on a rolling bridge and was placed by two men who also sprinkled it. The longitudinal slot, transverse slots and expansion joints, were poured with tar by ten men using a Littleford tar kettle and hand pouring pots. The covering of the slab the morning following pouring was done by subcontract by six or seven men and from three to nine of the contractor's men sprinkled the cover for seven days. Two teams and drivers on one side handled the pulling and hauling forward of the forms which were unloaded by the form setters. The contractor preferred to use the two teams on one side so as to leave the other clear for the water line, hose and the storage of the fabric mesh reinforcing.

WATER SUPPLY FURNISHED BY TWO PUMPS

The water supply for the paver and for sprinkling was furnished by two Rex triplex pumps set up at the same stream but pumping in opposite directions. A 2½-inch pipe was run along the shoulder with taps for the paver hose every 250 feet. The paver carried 150 feet of 6-ply Parkway hose furnished by the New York Belting & Packing Co. A 3-foot piece of hose with the usual coupling and a Mulconroy tightening device was used on the taps and one was always set on the tap ahead of the paver. The outer end of the short length of hose and the end of the paver hose away from the paver were equipped with Quick-as-Wink fasteners which only require pushing together to give a tight connection under pressure. The two burlap men and the tail graders with whoever was free at the minute moved the hose ahead.

PRECAUTIONS WHEN SOFT GRADE WAS ENCOUNTERED

The contractor always carried a stock of $\frac{3}{8}$ x 24-inch steel plates in 10-foot lengths for use ahead of the paver to prevent the trucks cutting the grade when it was soft. At one time on this job where the grade was adjacent to a swamp the plates were pushed down so that a ridge which came as high as the transmission showed all along the grade. The use of the plates hastened the time when the trucks could be put to work after a rain and saved many valuable working hours.

PERSONNEL

This contract which called for the completion of 13 miles of 20-foot pavement in 120 working days with 10 working hours per day and a 50-second mix was completed on time by McKenzie & Kileen of Minneapolis, Minn., and Superior, Wis., with G. H. Rouse as Superin-

tendent. C. E. Torgerson was Resident Engineer for the Wisconsin Highway Commission on this project.

Work on New Road Jobs in Minnesota

FOLLOWING the opening of bids on September 20, 1932, at the Minnesota State Highway Department office, contracts were awarded on twenty-nine improvement projects which will furnish employment for workers as long as weather conditions permit and which, when completed, will make material improvements to several trunk highway routes. Fourteen of the projects are in the emergency relief classification and employment on them will be subject to the regulations imposed in connection with the granting of the emergency Federal Aid. Other projects include grading, graveling, shouldering, paving and bridge work.

Excavating for a California Highway

HIGH speed in excavation is a feature of the Basich Bros. contract for relocation of the highway between Carquinez Bridge and San Pablo Creek, in Contra Costa County, Calif. This contract represents 10.75 miles of new road, with 291,000 yards of excavation and 2,141,000 yards of overhaul. Work was started July 7 and is to be completed in 300 working days, by June 22, 1933. On September 7 the grading work was approximately four-fifths completed.

The construction involves two methods—the use of a rooter and scrapers for about 80 per cent of the total excavation and fill and the use of the power shovel and truck method for the remaining 20 per cent. The rooter and scraper work was done first and is now practically completed. The shovel and truck work still to be done includes the widening of cuts already in existence where sections of the old location are being used for the new road, the filling in of shoulders along the existing highway and some excavation. The soil encountered includes considerable sandstone on the eastern end of the work and a mixture of sandstone and clay on the western end. Except in one cut, no explosives have been used, the rooter being sent through the sandstone without any preliminary breaking up.

The equipment used in grading includes two LeTourneau 7-yard scrapers, two 9-yard Carry-all scrapers, one rooter, one three-section sheepfoot roller, five Caterpillar Sixties, one Thirty, two LeTourneau bulldozers, a power shovel, trucks and a grader for working along the shoulders.

The new road will be of three-car width and is, except for 1,100 feet, an entirely new highway. It will be paved with asphaltic concrete except on the steeper grades, where portland cement concrete will be laid. Basich Bros. is the contractor for both grading and paving.



WORK ON THE SAN PABLO CREEK CONTRACT OF BASICH BROS.

The spreading of earth fill is shown in the left background and a scraper returning empty is seen at the right

Drilling and Blasting

in Highway Grading

Part IV

Reported by

Andrew P. Anderson

Highway Engineer

Division of Management

U. S. Bureau of Public Roads

HERE are apparently several other conditions which influence the rate of drilling but upon which definite data are difficult to obtain. Thus, the rate at which the drill will cut in a given rock depends on the air pressure at the drill, the type and condition of the drill bit, and the hardness of the cutting edge or the length of time that the cutting edge remains fit for rapid cutting.

High air pressure is not of itself a guarantee of a high drilling rate for the average job. In hard rock a working pressure of over 100 pounds per square inch at the drill is very likely to cause excessive drill breakage. In a soft, seamy, or highly stratified rock with a large angle of dip, working on full open throttle at this pressure is likely to cause excessive sticking. In rock of this kind a working pressure above 100 pounds per square inch at the drill is not necessary.

This table shows the effect of air pressure at the drill on the rate of cutting hard granite, and hard stratified limestone. The stratifications, however, were all practically horizontal and therefore did not add to the difficulty of drilling.

EFFECT OF AIR PRESSURE AT DRILL ON RATE OF DRILLING WITH 7-POUND JACK HAMMER IN GOOD CONDITION. HOLES 8 to 15 FEET IN BOTH STUDIES

Hard Limestone with Horizontal Strata		
Working Pressure at Drill Pounds per square inch	Rate of Drilling While Drill was in Actual Operation	Number of 1-hour Studies
56	11.0	1
60 to 70	23.8	22
70 to 80	22.8	44
Above 80	28.9	2
Hard Granite		
45	1.5	1
50	8.7	3
60 to 70	13.9	6
75 to 87	21.8	5

On a great majority of the jobs studied the working air pressure at the compressor ranged from 80 to 100 pounds per square inch. Thus, only one job was found which used a regular working pressure of 125 pounds and only one job using a regular working pressure below 70 pounds per square inch. But the pressure at the compressor may be quite different from that at the drills. In general, too little attention is given to the size or condition of the pipe and hose lines. Air leaks were numerous in most lines. Gage readings on one job showed an average loss of 1 pound of pressure for each 16 feet of $\frac{3}{4}$ -inch hose or $\frac{3}{4}$ -inch ordinary pipe line when supplying one drill at about 75 pounds pressure. Few jobs were found, however, with a pipe line as small as this. The more common size was 1-inch for the pipe al-

though the use of $\frac{3}{4}$ -inch hose was fairly common. A few jobs on which four to six drills were in regular use from a common pipe line used 2-inch pipe, while one job had a $2\frac{1}{2}$ -inch line. Pipe lines as long as 1,200 feet were found in use. Needless to say pipes of this length must have very tight unions and be of sufficient size for the number of drills to be supplied, or the working pressure will be very low.

TIME LOSS IN UNPRODUCTIVE OPERATIONS

On present jobs from 7 to 12 per cent of the working time is lost in changing drills, although it is known that the practice of using each steel until its full depth has been reached is far more common than that of changing the steel when it has become dulled to such extent that the rate of penetration is materially reduced. Thus, the common practice is to cut the steel into lengths which are multiples of $1\frac{1}{2}$ or 2 feet, the latter being the most common. But hard and difficult rock will often dull the steel so much in drilling one foot that the time required for the following 6 inches is equal to that required for drilling the first foot. About the only times regular changes are made before the drill length has been attained is when the drills regularly lose so much gage that the following drill will not work readily. And even these conditions are usually blamed on the blacksmith, who is importuned to increase the die.

Under normal field conditions the drill is cutting rock only from 35 to 60 per cent of the total time the operator is on the job. The rest of the time is largely consumed in performing a number of necessary but unproductive operations, such as changing steel, blowing the hole, moving to the next hole, oiling the drill, etc. Frequently additional operations become necessary or are added to the duties of the drill operator, such as removing a stuck steel, clearing overburden, bringing up steel, or springing the drilled holes. The amount of time consumed in performing each of these operations varies with a number of factors, among which the skill and experience of the operator and the kind, character, and nature of the rock play a very im-



In some rock an inexperienced or careless operator will spend much of his time removing stuck steel. Poor sharpening equipment or a careless blacksmith will intensify this trouble.

portant part. The time studies show that some operators regularly consume at least twice as much time in changing steel as do some others, while in certain kinds of rock the unskilled or inexperienced operator frequently loses much more time in extricating stuck steel than his more skilled and experienced co-worker. The amount of time lost in performing the various necessary unproductive operations is also dependent on the character of the rock. In rock in which the drill will cut at the rate of a foot in two minutes the number of steel changes per hour will ordinarily be about twice as many as in a rock in which the drill will only cut at the rate of a foot in four minutes. On the other hand, in soft rock more time is usually required for such operations as blowing or cleaning the hole and from steel getting stuck, while in very hard rock much time is frequently lost from broken steel, especially if the air pressure at the drills is too high.

The actual time in which each individual operation can be performed also varies with several factors. For example, aside from the skill of the operator, the time required to exchange steel varies with the depth of the hole. The following is a typical set of stop-watch readings of the exchange time for an excellent operator while drilling a hole 15 feet deep in fairly hard but uniform granite: 20, 22, 25, 32, 40, 40, 47, giving an average exchange time of 32 seconds for the hole. The first and second exchanges of steel are frequently made in 15 to 20 seconds and single individual readings as low as 12 seconds are on the record. The increase with depth is rapid, and a 20 to 25-foot steel is seldom exchanged in less than a minute with the average time nearer 2 minutes. If the steel happens to stick or bind in the chuck, as is frequently the case, the exchange time for that particular change may readily be doubled or even trebled. This is the reason why the records of many thousand stop-watch studies show an average exchange time of about 45 seconds for holes from 12 to 15 feet in depth, while the individual readings range from 12 seconds to somewhat over 6 minutes, and the percentage of the operator's time consumed in exchanging steel varies from less than 3 per cent to over 25 per cent with an average of 8.9 per cent for 20 fairly large jobs.

The contractor who has much rock work should therefore find it profitable to give considerable attention to the training of the drill operators to perform all

necessary operations in the shortest possible time. The drilling crew is really only productive when the drill is actually cutting rock. The various operations which interfere with actual production should therefore be reduced to the lowest limit. The contractor's interest must not end with simply insuring a high utilization of the available time. He must also see that the utilized time is converted into the greatest possible number of linear feet of properly placed and spaced holes. This requires the constant maintenance of adequate air pressure at the drills, together with an abundant supply of properly sharpened and correctly tempered steel of the right length within easy reach of the operator. One of the surest ways to make certain of low production from the drilling crew is to permit any one of the following to occur: low air pressure at drills, too soft or too hard steel, poorly sharpened or poorly gaged steel, or requiring the drill operator to bring up his own steel or to move a heavy overburden in order to locate the holes. Under many conditions any one of these can readily reduce production more than 25 per cent, and if two or more are allowed to occur simultaneously production may readily drop to one-half of what would otherwise be possible.

(Continued in the January issue)

An Elevated Super-Highway Rushed to Completion

ONE of the world's most amazing, yet practical, highway structures was recently completed between Jersey City and Newark, N. J. This is the elevated super-highway leading to the entrance of the Holland Tunnel which connects New Jersey with New York City. The long steel structure crosses 3 miles of Jersey meadows at a sufficient height so that highway traffic will not be held up by the raising of draw spans, two of which must be crossed on the older roadway. With this new structure it is possible to cover a distance in 5 minutes which formerly required anywhere from 20 to 40 minutes, depending on traffic density and the number of ships demanding passage through the bridges. Gen. Hugh Scott, Chairman of the New Jersey Highway Commission, stated that the distance eliminated by this new highway and the reduction in driving time would result in an estimated direct saving of \$17,000,000 a year.

The elevated super-highway is paved with concrete and rises from 100 to 150 feet in the air crossing both the Passaic and Hackensack Rivers, railroad tracks and yards and highways. It is estimated that 18,000,000 cars a year will use this specially designed steel and concrete viaduct.



Trackson Crawler Wagons Working With Allis-Chalmers Tractors on Levee Construction Near Vidalia, La. This Equipment Is Owned by Carl Erickson, Subcontractor on the Valley Construction Co. Job Near Vidalia, La.



The Editor Comments —

The Relation of Construction to Business Stability

The National Conference on Construction, held at Washington, D. C., in October, drew up a series of resolutions which contained a great many worthwhile suggestions. Among these resolutions is one on the relation of construction to business stability which should receive widespread publicity. It reads:

"Construction can be made a great stabilizer of business activity. While over-expansion in any industry produces difficulties, over-expansion in construction introduces elements of dangers for all business endeavor. Similarly, violent contraction in construction tends to produce more widespread effects than contraction in any other line, stagnating endeavors in multiple directions. Orderly and healthy development of construction, freed from wide fluctuations, is essential to economic stability."

"The possibility of securing such development requires reexamination in the light of our present situation. The immediate pressing problem is to hasten in all practical directions the restoration of confidence which will release private capital and credit into construction and other trade invigorating channels. But scarcely less urgent is the related problem of discovering practical ways and means for obtaining an orderly and balanced volume of construction, efficiently produced and reasonably adjusted to the country's needs for private building, for utilities, and for public works."

Stimulation caused by the World War brought about tremendous over-production of industrial plants, many of which were never used after the war even during the boom years of 1928 and 1929. In fields not connected with munition production, the boom years caused tremendous strides in construction for industry resulting in vast over-production of business structures for housing factories and offices. The only form of construction which really lagged was the building of low-rent housing projects to replace the slums of American cities. All other forms of construction progressed at a terrific pace.

Since 1929, construction has been suffering from this over-production which if it could have been spread over five years instead of two, or ten years instead of five, it would have provided more uniform employment for the various trades engaged in construction and would have smoothed out the peak production of construction equipment. Long term planning of construction projects is necessary. This is not as easily possible in construction for individuals, but large corporations can plan industrial and housing developments to continue over long periods. Public utilities in the past have been probably the most uniform planners of construction and spenders of money in that field. The greatest improvement in construction conditions can be fostered by our

municipalities, states and Federal government, through careful planning of progressive construction in all fields of governmental endeavor and the award of contracts for this type of work to responsible contractors.

A Word from One Who Appreciates Contractors

Robert Ridgway, Chief Engineer of the Board of Transportation, New York City, retired from that post on October 31, 1932, after having worked for New York City in its water department or in connection with its transportation facilities for 48 years. During this period Mr. Ridgway was intimately connected with the construction of the new Croton Aqueduct and the various subways, having close contact with the contractors engaged in those vast projects.

At a dinner given to Mr. Ridgway upon his retirement, he spoke of the contractors he had known during the past half century and commended the quality of the work done by these men. He said, "No sympathy is wasted by the public on contractors who have to take a loss for construction of public works, and there have been many such. Note how many of the oldtimers have been driven to the wall after contributing in the way of losses to the work that the public uses . . ."

Normal Times

In a notice received from Fred G. Wieland, an active organizer and promoter of exhibits and expositions in the Southwest, we have found the following sentence which is worth pondering upon, "These times are normal for the man who waits for something to turn up, and the organization which waits for its ship to come in may find it to be a receivership." Jobs are not plentiful, contract lettings are not plentiful, machinery sales are not plentiful, even advertising is not plentiful. We must all get out and sell, not by the old high-pressure quota method, but sell our services, our equipment and our advertising pages by showing the customer the value of each specific product to him.

Remember the Highway and Building Congress

On January 16-23, 1933, a Highway and Building Congress, sponsored by over thirty national organizations connected with the construction industry, will meet in Detroit to discuss mutual problems in an endeavor to stabilize the construction industry. In connection with this, a Road Show will be held at the Detroit Municipal Airport under the auspices of the American Road Builders Association, and I urge the readers of *CONTRACTORS AND ENGINEERS MONTHLY* to attend and participate in the discussions.

Theodore Reed Kendall

A Balanced Program of Production and Sales

By
William H. Ziegler
President
William H. Ziegler Co.
Minneapolis, Minn.

"PROFITLESS PROSPERITY" ended in 1929. The program of over-production was brought about and carried along by super-sales plans of one kind or another, all of which required an increasing volume each succeeding year. The net result of this program was a gradual increase in the cost of goods, and required increased expenditures which were not justified. Scores of high-priced salesmen were located in various cities and states, all of which added to the expense of the program. These sales organizations were spurred on by the sales manager who insisted on a big increase in everybody's quota each year. Sales were made that should not have been made. Business was secured in 1929 that should not have been placed for several years. The market was forced years ahead of normal requirements. Now these expensive sales organizations of the "prosperity" era have quite generally disappeared.

The productive capacity of the United States is such that almost over night more goods can be produced than can possibly be consumed. If the producing forces permit themselves to engage again in unlimited competitive policies, we shall soon be back where we were in 1929. It would, therefore, seem reasonable to assume that a sane, balanced program of production and sales is vital. To secure this, it may be necessary to adopt a plan of shorter hours, staggered employment, one shift operation with no extra days or overtime, to maintain a steady production, perhaps even slightly behind consumption, which in the long run will mean more years of good business and less years of profitless prosperity and fewer depressions.

The construction equipment distributor can be a vital asset to such a conservative program of sales distribution. If he has been able to survive financially, he is now in a stronger position as a distributing force than ever before. His set-up is logical and natural. He is a local institution, pays taxes, belongs to local organizations, takes part in community fund drives, and is regarded as a thoroughly local concern by business men in the community. Being a local institution, and not simply a salesman or district office which is changed from time to time, the distributor devotes his entire thought and planning to develop his business over a period of years which in the end will mean a sufficient competence to maintain himself, his family and those associated with him. He understands the needs of the territory, the things that will work satisfactorily and avoids those that will not. His sales are based on a sound program of public and private requirements. He can be trusted not to oversell his market because he must live with these people after the sale. He presents to the manufacturer a means of distributing his product at a minimum cost and places the manufacturer in the position of having intimate local relationships and representation. He offers the lowest cost sales distribution by reason of his set-up, spreading the costs over many lines. This is important, for not all commodities command large sales every year and many are seasonal. In such cases the manufacturer has no selling expense except when his distributor sends his orders. With the other system of district offices, salesmen and direct selling,

the expense goes on, day and night, in season and out, with or without business.

We hear much of the excess costs of middle men, distribution and so on. Some selling organization must be provided for every commodity. There is nothing that will command sales without selling effort. What can be simpler, cheaper or more logical than a distributor organization taking the manufacturer's product direct to the consumer?

While the years 1930, 1931 and 1932 have been hard on distributor organizations, as on manufacturers and others, the period ahead looks very bright. The most encouraging feature of all is that the distributor has stood the test, his position is conceded more logical than ever, he is accepted as the medium for the lowest cost of distribution and his contribution to the industry is one that commands greater respect and attention.

New Distributor Appointments

Gardner-Denver Co., Quiney, Ill., has announced the appointment of the Southern Machinery & Supply Co., Roanoke, Va., as distributor for its complete line of rock drills and accessories, portable and stationary air compressors, steam and power pumps.

O. K. Clutch & Machinery Co., Columbia, Pa., has appointed the Engels Tractor Co., Inc., 334 N. Genesee St., Utica, N. Y., as its exclusive representative in that territory. The distributor will carry the complete line of O. K. gasoline and electric hoists and air compressors.

Rex-Watson Corp., Canastota, N. Y., has announced the appointment of Frank B. Harris, Yacht Sales & Service, Inc., 401 No. Broad St., Philadelphia, Penna., as its representative for the sale of the new patented Watson tractor-hitch trailers. Mr. Harris has had a broad experience in both automotive and boat merchandising lines. His territory includes eastern Pennsylvania, southern New Jersey, Delaware, Maryland and the District of Columbia.

Marmon-Herrington Co., Inc., Indianapolis, Ind., manufacturer of all-steel drive trucks, has appointed the Associated Equipment Co., Ltd., 355 Fremont St., San Francisco, Calif., as its distributor in northern California and Nevada. J. H. Heil is President, William C. Gunther, Secretary, and W. H. Worden, Director of Sales. The R. L. Harrison Co., Inc., R. L. Harrison, President, of Albuquerque, New Mexico, has been appointed distributor for the state of New Mexico.

Federal Relief Act Speeded Concrete Road Awards

GOOD weather and the need for employment caused many states and counties to hurry concrete road plans to early completion so that they could be let before the close of 1932. Illinois leads with 10,000,000 square yards, equivalent to 850 miles of 20-foot highway, already under contract in 1932 and much of it completed. Texas and Wisconsin follow closely with only slightly smaller mileages under contract. Minnesota, with over 5,000,000 square yards now under way, is engaged in the largest construction program in its history.

Authorities are taking advantage of low prices and the fact that over 90 per cent of each dollar spent for concrete pavement goes to labor, directly or indirectly. Maine began an unusually large season's program with upwards of 400,000 square yards; Georgia took bids on 48 miles at one letting and Missouri's record letting included 107 miles.

More lettings have been scheduled as fast as plans can be completed. New impetus has been added by the emergency loan of \$120,000,000 Federal Aid from the Relief Act to be spent before July 1, 1933.

Construction Industry News

Blaw-Knox Co., Pittsburgh, Pa., has announced an arrangement with the Madsen Iron Works, Los Angeles, Calif., whereby Blaw-Knox will manufacture and sell complete plants of Madsen design and patent for pre-mixing asphaltic pavement material in territories in the United States east of the Rocky Mountains and in countries outside of the United States of America.

Good Roads Machinery Corp., Kennett Square, Penna., entertained its dealers and representatives at the main office and factory on November 18 and 19. The purpose of this meeting was to acquaint the field men with various developments under way and to discuss future plans.

Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill., has appointed George M. Sharer as Sales Manager of its eastern division with headquarters in Philadelphia, with direct supervision of sales of all of the company's offices in the Atlantic Coast states. He is a Mechanical Engineer and has been connected with Link-Belt in Philadelphia for the past 32 years. This company has also announced the appointment of Moore-Handley Hardware Co., Birmingham, Ala., as distributor in the Birmingham territory for the entire Link-Belt line of elevating, conveying and power transmitting machinery. Moore-Handley Co., which has just celebrated its fiftieth anniversary, will also carry a suitable stock of Link-Belt chains, gears, sprockets, transmission machinery, screw conveyors, and chain drives.

Worthington Pump & Machinery Corp., Harrison, N. J., has announced the appointment of Hugh Benet as manager of its Harrison, N. J., works. Since 1927, when Mr. Benet became associated with Worthington, he has served as manager of the Holyoke, Mass., works.

Caterpillar Tractor Co., Peoria, Ill., has announced that George L. Wennerlyn, who has served that company and the Russell Grader Mfg. Co., for 20 years, has moved from Minneapolis to become Assistant Advertising Manager at Peoria. Mr. Wennerlyn's chief responsibilities will be in the utilization of advertising material, including dealer and district representative contacts, and the supervision of dealers' local display advertising and direct mail programs. Mr. Wennerlyn is one of the pioneers in the good roads advertising field. His record includes 8 years with Dallenmayer Advertising Agency at Minneapolis, 16 years with Russell Grader Mfg. Co., Minneapolis, in sales and advertising and 4 years with the Caterpillar Tractor Co. as Assistant Manager of the Minneapolis Plant.

Union Steel Casting Co., Pittsburgh, Pa., has announced the election of Merrill G. Baker, prominent engineer and recently assistant to the vice president of Ford, Bacon & Davis, Inc., to the position of President. Jan R. Dunsford has been elected Chairman of the Board.

Sprout, Waldron & Co., Inc., Muncey, Pa., has announced the removal of its New York office from 75 West St., New York City, to 223 Cowperthwaite Place, Westfield, N. J. David E. Smyth is District Manager.

Better Control of Air for Pneumatic Tools

AN automatic air-control valve, which permits definitely limited quantities of air to pass at various pressures, the quantity varying directly as the pressure, has been developed by the research department of the Jeddo-Highland Coal Co., which has sold the manufacturing rights to the Yarnell-Waring Co., Philadelphia, Pa. The valve is designed to prevent waste of air in the operation of pneumatic jack hammers and is equally effective for paving breakers working in congested sections where the whipping of a broken or disconnected hose is a serious hazard for pneumatic riveters and for other work involving air pressure. With modifications it can also be used in sectionalizing water lines.

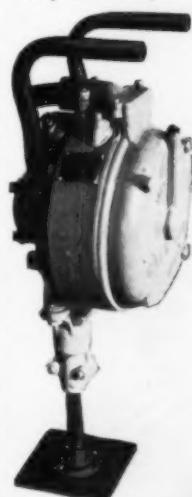
The valve, placed near the end of the air line, consists of a globe valve body and a separate operating mechanism, fastened together and sealed to prevent tampering. In the simplest form, it consists of a piston in the operating housing, connected by means of a hollow valve rod to the valve disc. This disc is pierced by a 1/16-inch hole. The piston is held in its lower position by a spring and the line pressure, which is above the disc.

The openings of the hollow valve stem are beyond the valve disc and into the cylinder below the piston. When the line below the valve is tight, pressure is established because of the leak through the disc. When this pressure beyond the disc approximates that of the main line, the valve opens against the spring. An orifice in the valve body on the incoming side causes a pressure drop through the valve, varying with volume. By spring adjustment, the valve will close at any pre-determined line pressure drop, corresponding to the volume flow. To compensate for variable line pressures, a second piston is employed to compress the spring in direct relationship to the line pressure. This spring receives its pressure from in front of the orifice and is not affected by the pressure drop through the valve. In operation the orifice is set for a given size tool and the springs adjusted to the flow for that tool. The valve is then sealed.

An Electric Backfill Tamper

An electric backfill tamper which delivers 1,800 heavy blows a minute for field use and which is operated by a compact, light weight gas electric power unit, has been announced by the Electric Tamper & Equipment Co., Lundington, Mich. This tamper is used for tamping and compacting earth backfill, for excavating clay or shale and may be used to advantage in demolishing brick pavement and for vibrating concrete on bridge decks.

The Jackson electric backfill tamper is not a new machine but is an adaptation of the Jackson electric tie tamper which has been used extensively by the principal railways in the United States for track maintenance. The tamper motor is wound for 110-volt, 3-phase, 60-cycle alternately current. The power plant is light, but is built to withstand weather conditions and severe service and may be used for operating any type of portable electric tools or lights for night work.



The Jackson Backfill Tamper



The New Hug Model 87Q Truck

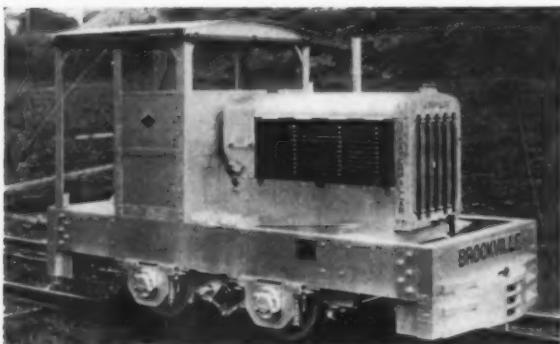
A 6-Yard Power-Hoist Dump Truck

A TRUCK especially designed for road builders and contractors to operate under shovels in gravel or sand pits or on multiple batch hauling jobs is being built by The Hug Co., Highland, Ill. This Model 87Q Roadbuilder has a 5½ to 6-yard power hoist body with a maximum load capacity of 16,000 pounds. The power of the 4-cycle, 6-cylinder Buda heavy-duty truck engine is transmitted through seven speeds forward and two speeds reverse, carrying the truck with its maximum load over rough roads. This truck has the Hug set-back front wheel design, the front spring rocker, cam and lever steering gear and multi-cushion rear spring. The large body has reinforced sides and a double-acting tail gate.

A New Tire for Tractor Service

A NOTHER new tire for tractor service, a pneumatic companion to the Goodrich Zero Pressure tire, has recently been announced by the B. F. Goodrich Co., Akron, Ohio. Known as the Tractor-Grader tire, this new product is of the lug type, designed for road service and constructed for hard knocks and severe driving torque. The tread design is self-cleaning, constructed to give clean positive sharp-edged gear wheel traction. The herringbone design insures straight forward motion and prevents side creep.

This tire is amply insulated with heavy gum coatings between each cord ply to eliminate the possibilities of bruises in severe service. Special consideration was given to the effect on tires of road oils and tar, resulting in a tread particularly adapted for use in building and maintaining tar-bound roads.



One of the New Brookville Locomotive Company's Caterpillar Engine-Powered Industrial Locomotives. Brookville Has Standardized on Caterpillar Engines for Its Larger Sizes of Locomotives

A New Elevator Bucket

A NEW design of cast elevator bucket for heavy-duty work with reinforced lips and reinforced back and ends has been announced by Link-Belt Company, Indianapolis, Ind. This style AAP bucket is made in the following sizes: 8 x 5, 10 x 6, 12 x 7, 14 x 7, 16 x 8, and 18 x 8. It has a heavy back and heavy lip, reinforced corners, front reinforcing ribs and a reinforcing head around the ends. The middle of the lip is raised to reduce the digging strains and the bucket is made of Promol, a strong, long-wearing metal which is also more durable than malleable iron. The ribs down the front and the heavy flat bead around the ends offer added resistance to the bucket's being twisted out of shape under severe service, as in the handling of stone, sand and gravel.

A New Steel Tape for Chain Work

A NEW steel tape made extra sturdy and designed especially for highway, railroad and other heavy work has been announced by The Lufkin Rule Co., Saginaw, Mich. This 5/16-inch wide chain tape or "Hi-Way Drag Tape" is of special tough steel, of extra weight, and practically unbreakable. It has etched graduations, with black lines and figures and Nubian finish. The markings and figures are prominent and deeply cut into bright high portions of the line itself making them particularly readable even after much dragging of the tape. The tape is graduated to feet only,



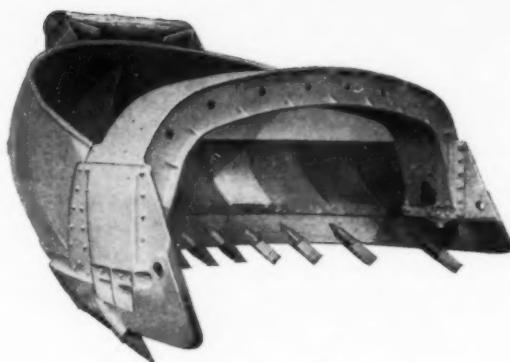
The New Lufkin Hi-Way Steel Tape

with the end feet graduated in 10ths and with the half railroad gage mark at 2 feet 4 1/4 inches from zero. It can also be had with an extra foot before zero graded to 10ths. It has heavy brass end clips and a pair of rawhide thongs. It is made in lengths from 100 to 300 feet, and is furnished with or without a metal reel. A conversion rule is supplied with each "Hi-Way" tape. This is a handy 6-inch boxwood rule marked in 10ths and 100ths of feet on one side and inches to 16ths on the other side.

A Combination Bulldozer and Backfiller

A HYDRAULICALLY operated bulldozer and backfiller which has been used in the west under extreme road construction conditions is being built by the Isaacson Iron Works, 2917 East Marginal Way, Seattle, Wash. These Isaacson Roadbuilders are built for Caterpillar, Allis-Chalmers and Cletrac crawler tractors.

The machines are controlled easily from the driver's seat by moving a lever which gives absolute control of the blade position at all times and under any conditions. The hydraulic unit has a distinctive pump assembly incorporating Timken bearings to minimize wear and assure trouble-free operation. The equalizer is of the latest design and construction and maintains the blade always in a horizontal plane and eliminates twisting of the frame. The hydraulic hoist holds the blade in any positive position or allows floating action when desired. A positive tilting angle of the blade can be maintained without twisting the main frame. The push load is taken on the drawbar in the rear of the tractor. The wearing parts of the Isaacson Roadbuilder are all replaceable and made of heat treated steel.



The New 12-Cubic Yard Crescent Drag Scraper

A New Light-Weight Drag Scraper

ANNOUNCEMENT has been made recently by Sauerman Bros., 464 So. Clinton St., Chicago, Ill., of a new Crescent drag scraper of 12 cubic yards capacity, a feature of which is that the weight of this new bucket is less than the 10-cubic yard standard model.

The new bucket is of welded construction, with a cast-steel bail. The lip and end castings are of heat-treated alloy steel, providing strength and resistance to crystallization. Tapered tooth sockets are cast integral with the lip, and renewable tooth points are fitted into these sockets. Each tooth point is held in place by a single bolt with the head imbedded in the tooth casting. The tooth has an octagonal tang, permitting it to be inserted with the direction of face at the most advantageous angle.

An Hydraulic Winder for Crawler Wagons

AN hydraulically-controlled door opening and closing mechanism for Trackson bottom-dump crawler wagons which supplements and does not replace the standard hand winding mechanism, which remains intact at the rear of the wagon for emergency use, has been announced by the Trackson Co., 1323 So. First St., Milwaukee, Wis. The hydraulic mechanism is installed on the front end of the body and is completely housed within a removable steel cover. Accessibility for renewal of door cables and adjustments is provided as well as automatic equalization of the door cable, eliminating sagging doors. Any stretch in the cable which would allow both doors to sag below their closed position can be removed by winding the surplus cable on the standard hand winding drum at the rear of the body. This takes only a moment's time and eliminates cutting off cable.



A Bottom-Dump Crawler Wagon Equipped with Hydraulic-Wind Mechanism

The hydraulic cylinder installed on the front of the wagon is actuated by an hydraulic pump connected to the tractor at the power take-off. A flexible hose connects the pump with the cylinder. The entire system operates at low pressure. The greatest amount of work performed by the pump is to close the doors which weigh about 500 pounds and which calls for relatively little pressure to be built up within the hydraulic system. All operations are controlled by the tractor operator, making it unnecessary to employ wagon winders. This system may be applied to wagons working singly or in tandem and pumps may be applied to all makes of tractors. When operating in trains of two, each wagon can be dumped independently of the other.

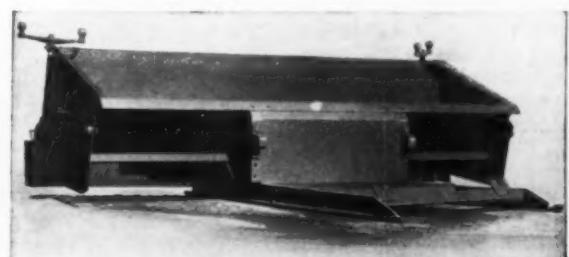
A 70-Pound Paving Breaker

A NEW 70-pound paving breaker, known as B-72, has recently been announced by the Gardner-Denver Co., Quincy, Ill. This machine has the new Gardner-Denver tubular-type short-throw face contact valve which is claimed by the manufacturer to maintain efficiency indefinitely.

The air inlet is in the cylinder which, in combination with an air space between the handles and the head, keeps the handles cool. The air consumption of the B-72 is low, so that a class 120 portable compressor can operate two of these machines at an efficient working pressure. A sheeting driver attachment with adjustable jaws, removable foot rests and auxiliary holding handles is available. Only 1 1/8-inch clearance is required for driving a second course of sheeting.



The New B-72 Paving Breaker



The New Galion Asphalt Spreader with Extra Long Runners

A New Asphalt Spreader

AN asphalt spreader of the box type which is equipped with extra long runners to insure a uniform distribution of material has been announced by the Galion Iron Works & Mfg. Co., Galion, Ohio. While the spreader is designed especially for asphalt work it will handle stone, slag and concrete equally well. It is attached behind a truck by means of chains and covers a width of 9 feet. Adjustable gates at each end of the machine may be opened to allow materials to flow out to a greater width.

Extra long smooth runners insure level action of the spreader with a uniform distribution of material. The depth of spreading is controlled by a self-locking screw adjustment, which is easily and quickly operated, with handles at each end of the box. A four section strike-off blade below the spreader is made so that it can be adjusted to any desired crown of the road. The Galion spreader box is made in two sizes, 8 feet and 9 feet wide.



*The LaPlant-Choate Bulldozer and Road Builder
Mounted on a Caterpillar Thirty-Five Tractor*

A Bulldozer and Road Builder

A HYDRAULIC road builder or bulldozer for use on the Caterpillar Thirty-five tractor has been announced by the LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa. The blade is 9 feet 4 inches long and is completely oscillating with adjustments provided so that either end can be locked into any position desired. The blade will oscillate up or down at 16 inches at either end. A sharp all-steel removable cutting bit is provided at each end of the blade. The blade can be set at an angle for backfilling or sidehill cutting work or it can be set straight across for use in bulldozing work. The blade has a 31-inch lift above ground level and can be forced into the ground 20 inches. The jack which forces the blade into the ground or raises it is double acting. The design of the bulldozer sets the tractor drawbar entirely clear.

Diesel Engines for Construction Equipment

THE diesel engine which has been developed by the Caterpillar Tractor Co., Peoria, Ill., for use in its diesel tractors, has recently been announced as a stationary unit for use in operating various types of construction equipment.

This engine has a $6\frac{1}{8}$ -inch bore, a $9\frac{1}{4}$ -inch stroke and is governed at 700 rpm, developing better than 85 horsepower. It has four cylinders, is four-cycle and uses the solid injection fuel system, and a pre-combustion chamber. The solid injection method of handling fuel on this engine is by means of individual pumps mounted on each cylinder. These are accurately calibrated and sealed at the factory, to preserve the intended settings under operating conditions. The fuel injectors have a single orifice of 0.086 diameter. A self-cleaning pintle keeps this orifice from clogging and maintains its prescribed dimensions. The fuel is first injected into a pre-combustion chamber where it is ignited by heat generated by high compression. The engine is provided with a positive starting mechanism, a small two-cylinder four-cycle gasoline engine, mounted on the side of the diesel itself. The engine is water-cooled, being connected to the diesel cooling system.

A Shovel with a Shock Absorber

A ONE-PIECE solid shank shovel, equipped with what is known as a shock band, has recently been announced by the Ames Baldwin Wyoming Shovel Co., Parkersburg, W. Va. This shock band is a tubing 4 inches long, 2 inches of which is $1\frac{1}{2}$ inches in diameter and the balance $1\frac{1}{4}$ inches. The smaller 2 inches is fitted inside the shovel shank, thus giving a double thickness of metal in the area where the strain of pry and leverage centers. The larger diameter section

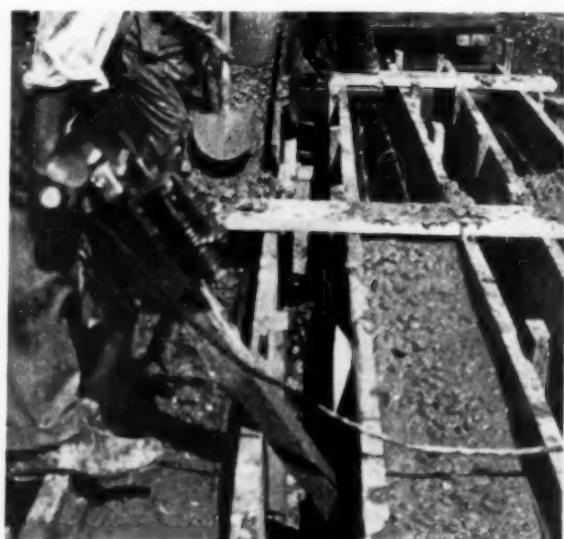
encases the wood above the socket so that the section of stress is completely armored. The shovel socket itself is welded at the seam so as to make a tube and give greater strength in itself. It is claimed by the manufacturer that this new shovel, because of these features, has a 21 per cent greater strength.

Another feature is the Armor-D handle. To the Northern Ash wood handle has been added an armor of steel that surrounds and locks the wooden fork. It supplies a smooth surface and is designed to provide protection against weathering, checking and splintering. Also it has ample room for a gloved hand.

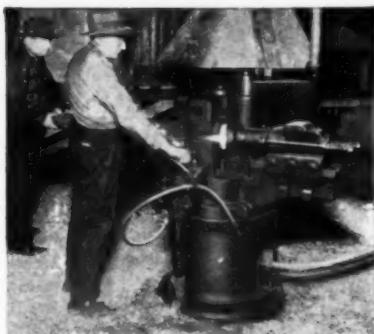
Electro-Magnet Vibrators for Concrete Forms

IT is quite common practice to deliver blows upon the exterior of a wooden form to compact the concrete for a thin wall as it is being placed, particularly when heavy reinforcing is used. A study of the vibrating of concrete to insure a dense mass has shown that shaking of the forms is preferable to heavy blows. The Syntron Co., Pittsburgh, Pa., has announced a new line of electro-magnet vibrators for vibrating concrete during construction work. This simple tool consists of a horseshoe magnet and an armature, the gap between the armature and magnet being held open by springs. By using the patented Syntron principle of a pulsating current, the gap between the magnet and its armature is closed 3,600 times per minute on a 60-cycle alternating current and the heavy mass of the armature moving at such a high speed sets up a powerful vibration that can be applied in a direct line toward any given mass which is to be vibrated. The vibrator is fitted with a handle and a vibrating spud for vibrating floor forms, flat slab placements or reinforcing bars in concrete products. Another attachment for the vibrators is a vise clamp for clamping the vibrators to the studs or wales of building forms. The third attachment is a chain clamp for attaching the vibrator to a round column or a round sewer pipe mold.

The largest vibrator, Model V-120, can be fitted with a puddling board for vibrating mass placement of concrete. These vibrators are built in various sizes for different applications, their main feature being in the simplicity of their design and construction, the freedom from moving parts and the fact that the flow of vibration can be directed in any desired line.



A Syntron Vibrator with Spud for Use in Pouring Reinforced Concrete Piling



A WD Sharpener Reconditioning the Bit of a Well Drill at a Stone Quarry

A Sharpener for Well Drill Bits

THE WD sharpener for well drill bits has recently been announced by Ingersoll-Rand Co., 11 Broadway, New York City. According to the manufacturer, actual reports from quarries indicate that the bits it produces effect a saving of from 50 to 61 per cent in drilling costs and 50 per cent in sharpening costs.

New bits can be forged on blank steels in two or three heats and dull bits can be redressed in one heat. The WD sharpener embodies the same fundamental principles of design and operation as the complete line of I-R sharpeners. It operates entirely by compressed air, all operations being controlled by a single throttle at a convenient position. At all times the work is in full view of the operator. A powerful cross head delivers the forging blows when forming the bit, and it clamps the steel while a dolly, actuated by a powerful cylinder, rapidly forges the face of the bit. The drill bit is upset in a cross head die, which firmly clamps the steel directly behind the bit. Water-channel swages are used to open the channel to the desired shape, thus eliminating the need of chipping or cutting away the metal. Bits up to 9-inch diameter on 6-inch by 4½-inch steels can be made on standard WD sharpeners, and dollies can be furnished to make any desired shape of bit.

Metallic Zinc Paint for Protecting Metal

TRAVELERS in the Rhine Valley and other industrial regions of Europe have noticed bridges, towers, and other steel structures painted grey with a metallic zinc paint. In this paint which is now being used to an increasing extent in the United States, according to the American Zinc Institute, Inc., New York City, the principal pigment is a metallic zinc powder of such an extreme fineness that it is frequently referred to as zinc dust. This powder, produced by a distillation process in specially designed furnaces, is mixed with zinc oxide in a linseed oil vehicle of the usual type.

Metallic zinc paint has been found to be a particularly effective protection against corrosion for all exposed metal surfaces. It has been used not only on steel buildings and other structures, but on electrical equipment, on the inside and outside of water tanks and under many other difficult conditions. It has been found to fill a real need in the painting of galvanized iron or sheet zinc surfaces, due to its unusual ability to adhere to the surfaces which present an especially difficult problem for most paints. It has been used for some time as a priming coat on all police department traffic signs in New York City and has been used for the same purpose

on the Mt. Hope Bridge at Bristol, R. I. This great steel structure is subject to especially severe exposure, due to the prevalence of heavy salt fogs and variations in temperature.

A New Portable Screening and Crushing Plant

PRODUCING road gravel which meets the specifications at a cost which will yield a profit has always been a serious problem to the gravel producer or contractor. The use of local pits is one of the best known methods of greatly reducing costs. However, in the face of many specifications requiring sized gravel and a certain percentage of crushed materials, the contractor now has the problem of needing more equipment to meet these specifications and still produce the gravel without excess cost.

A new crushing plant, designed to work in conjunction with a standard B-G bucket loader with vibrating screen, the two units forming a complete excavating, screening, crushing and loading plant which is self-propelled and portable, has recently been announced by the Barber-Greene Co., 485 West Park Ave., Aurora, Ill. With this unit it is possible to take advantage of short truck hauls by utilizing local pits, changing the source of supply as often as necessary.

The loader with vibrating screen is a complete unit in itself, having its own gasoline engine which drives the crawlers as well as the buckets and screen. The crushing plant is towed behind the loader and has its own engine which drives the crusher and the conveyors. The plant can work directly into the bank or into the stockpile, and the entire machine moves forward as the material is excavated. The spiral feeder carries the material to the buckets which elevate it and discharge onto the double deck vibrating screen. The oversize passing over the screen flows through a gravity chute to the crusher. The crushed materials are sent back to the feeding end by a belt conveyor on the crusher unit. The material that passes the top deck and not the second deck flows down to the hopper of a conveyor that carries the correctly-sized material out to the trucks. The fines passing the second deck are carried to one side by a cross conveyor that is part of the screening unit. These can be allowed to pile on the ground or be received by trucks as desired. Only one operator is required. Although the capacity of this type of plant is variable, being dependent on the percentage of fines, oversize and required size in the bank, it has proved its ability to handle from 40 to 50 cubic yards per hour of sized material delivered to trucks.

Where only screened material is required, the bucket loader and screen do the work, and if only bank-run material is wanted, the screen drive may be disconnected and a veil plate placed over the top deck. The entire plant moves under its own power without dismantling.



The New Barber-Greene Portable Screening and Crushing Plant



A Typical Madsen Blaw-Knox Mobile Asphalt Plant

A Mobile Three-Unit Asphalt Plant

MOBILE asphalt plants consisting of three units, the mixing unit, the asphalt heating unit and the boiler unit designed by the Madsen Iron Works, Los Angeles, Calif., are now manufactured by the Blaw-Knox Co., 2067 Farmers Bank Bldg., Pittsburgh, Pa., for sale in territories in the United States east of the Rocky Mountains and in countries outside of the United States. These plants prepare and mix the material for all types of asphalt, bituminous concrete, oil mix and cold-laid pavements. The entire plant is fully portable and is transported on a set of wheels interchangeable between three units, furnished as standard equipment.

Each of the three units is so designed that the frame members act as the chassis on which they are moved. This design allows the permanent mounting and alignment of all operating parts and obviates the time-consuming tearing-down and subsequent assemblies. The mixing unit proper comprises the general assembly of the elevator dryer and screen, aggregate bin, aggregate weigh-box, asphalt-weighing equipment, twin shaft pug-mill mixer, and electric power drive. For diesel or gasoline engine drive the power unit is separate. At each of the four corners of the upper platform a ratchet-operated jack is built in. The dryer-screen and mixer units are raised or lowered on the corner columns by operating these jacks. Thus these heavy units are easily handled, raised or lowered without necessity for a crane or other hoist.

The asphalt heating unit is of sufficient capacity to insure a continuous supply of hot bituminous material under any present specifications. The heating unit comprises equipment which is modern and unique in design. The boiler is constructed in accordance with A.S.M.E. specifications for a working pressure of 150 pounds and is permanently mounted on a steel frame on which it is operated and transported. It is thoroughly insulated and completely equipped.

A feature of the Madsen Blaw-Knox asphalt plant is the asphalt gun. This is a steam-ram operated injector which forces a weighed quantity of asphalt cement into the mixer when the operator moves the control valve.

The plant is completely operated by three men, one of whom controls the mixer and other plant functions including the aggregate gate levers, the weigh-box discharge, the charging of the bituminous oil, the mixer discharge and other functions at the plant proper. The fireman, in addition to tending the boiler, also supervises the heating of asphalt and the transfer of asphalt from delivery trucks or storage to the heating unit. The handy-man oiler also acts as relief mixer man and tends the dryer and screen unit on the top platform.

The mobility of this plant is clearly indicated through a recent report received by the manufacturer from a prominent

contractor in Minnesota. This contractor moved his entire plant 65 miles, beginning his dismantling on Friday morning and on the Monday following, at noon, was actually mixing materials for the new contract.

A New Half-Yard Excavator

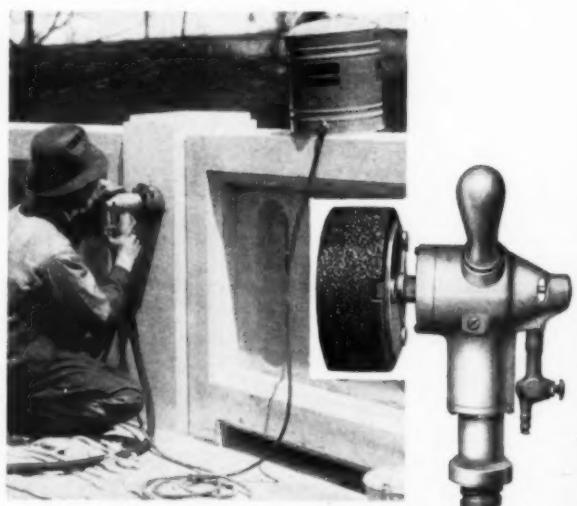
A NEW $\frac{1}{2}$ -yard excavator, known as the 16-B, which combines greater digging ability per pound of weight, has recently been announced by the Bucyrus-Erie Co., South Milwaukee, Wis. Its weight is under 30,000 pounds and its large 6-cylinder engine develops 54 horsepower.

Among the features of this new machine are conical swing rollers rolling between two roller paths, eliminating a center pintle, the elimination of dead weight, no dead counterweight, chain crowd with high speed retraction, unit assembly, single-shaft drive mounting, all clutches interchangeable, all welded box-girder boom and outside sticks, and an efficient digging and free-dumping inserted-tooth dipper. A choice of gasoline, diesel or electric power is available. The machine is readily convertible for use as a shovel, dragline, clamshell, crane, drag shovel or skimmer scoop.

A New Machine for Wet-Rubbing Concrete Construction

A NEW surfacer for wet-rubbing all kinds of concrete construction, known as the Berg water-feed concrete surfacer, has recently been announced by the Concrete Surfacing Machinery Co., 4559 Spring Grove Ave., Cincinnati, Ohio. This machine not only displaces hand rubbing but also does away with the necessity of wetting the surface with a brush.

A number of features have been incorporated in this machine, including the water control valve at the thumb of the operator and the water outlet in the center of the carbo-disc, as well as the fact that water can not enter the gear housing. This surfacer can be furnished as a complete machine, consisting of the water-feed head and any one of the Berg motor units, or just the water-feed head, known as Berg Model W, may be purchased as an attachment for Berg concrete surfacers now in use.



The New Berg Water-Feed Surfacer for Wet-Rubbing Concrete

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Lights for Night Work

100 V-G carbide lights which give daylight conditions on night jobs, spread a full even beam of 8,000 candlepower where it is needed, and light up the job for twelve hours on one 7-pound charge of National 14-ND carbide and 7 gallons of water, are described in literature which the National Carbide Sales Corp., Lincoln Bldg., New York City, will be glad to send on request.

A New Complete Line of Bituminous Machinery

101 Chausse Oil Burner Co., Elkhart, Ind., will be glad to send to those interested descriptive literature covering the new complete line of Chausse bituminous road and street machinery for making hot and cold mixes, including road mix pavers, central cold mixing plants, pug mill mixers, pre-mix plants, driers for sand and stone, street repair patchers, asphalt plants, tar kettles and surface and tool heaters.

Asphalt Planking for Bridges

102 Complete information in regard to Servicised fibrated asphalt planking for bridge installations, as well as asphalt expansion joints, may be secured by interested contractors from Servicised Products Corp., 6051 West 65th St., Chicago, Ill.

Engines for Construction Equipment

103 Dependability and long years of service are two of the features for which Continental engines for construction equipment are designed. Complete information in regard to these engines and the type of service they render in the field of construction may be secured from Continental Motors Corp., Detroit, Mich.

Construction Equipment

104 McKiernan-Terry Corp., 19 Park Row, New York City, will be glad to send to interested contractors literature describing its line of construction equipment, including pile hammers and extractors, hoists, derricks, whirlers, cableways and bridge operating machinery.

A New 3-Way Wagon

105 Complete information in regard to the new Euclid 3-way dump wagon, features of which are the Euclid double coil spring axle brackets to eliminate severe loading shocks, heavy frame construction, a body designed for easier spotting, and a mounting on 20-ton Permo-Arch track wheels, may be secured by interested contractors from the Euclid Road Machinery Co., Cleveland, Ohio.

Orange Peels for Dredging

106 Hayward Co., 32-36 Dey St., New York City, will be glad to send to interested contractors complete information in regard to Hayward orange peel buckets for dredging, digging canals and sewers, sinking bridge piers and similar work.

Corrugated Metal Culverts

107 Complete information in regard to Gohi corrugated culverts, made of copper-bearing pure iron which meets all accepted specifications for corrugated metal culverts, may be secured by those interested from Gohi Culvert Manufacturers, Inc., Newport, Ky.

Single-Stage Centrifugal Pumps

108 Class LS single-stage centrifugal pumps designed to meet demands for compact self-contained pumping units of high efficiency built in sizes from $\frac{1}{2}$ to 4 inches for capacities up to 700 gpm and heads up to 75 and 85 feet at 1,750 rpm, depending on the size; also for high heads at 3,600 rpm up to a maximum of 20 horsepower, are described in Bulletin 218 issued by the Pennsylvania Pump & Compressor Co., Easton, Pa.

All-Steel Hand Hoists

109 Beebe all-steel hand hoists which have a straight-line capacity of 5 tons with two speeds of 4 to 1 and 24 to 1 are described in literature which Beebe Bros., 2724 Sixth Ave., So. Seattle, Wash., will be glad to send on request.

Expansion Joints for Concrete Paving

110 Literature describing Carey Elastite expansion joints, the sandwich joint which protects concrete paving against expansion and contraction stresses, may be secured by interested contractors from the Philip Carey Co., Dept. E-1, Lockland, Cincinnati, Ohio.

Frost Free Air-Lines

111 Sullivan Machinery Co., 400 North Michigan Ave., Chicago, Ill., will be pleased to send complete information about Tanner-tanks, an anti-freeze air-line system which is simple, foolproof, suited to all conditions, and which guarantees the prevention of freezing troubles in your compressed air lines during the winter.

A Mobile Asphalt Plant

112 An illustrated bulletin describing Madsen Blaw-Knox asphalt plants for pre-mixing asphaltic pavement materials and consisting of three units: the mixing unit, the asphalt heating unit and the boiler unit, will be sent to municipal officials and contractors interested in portable plants of high efficiency, by writing direct to the Blaw-Knox Co., 2067 Farmers Bank Bldg., Pittsburgh, Pa.

A Shovel with a Shock Absorber

113 The A B W one-piece solid shank shovel, features of which are the shock band and the Armor-D handle which are designed to give greater strength and wearing qualities is described in literature which the Ames Baldwin Wyoming Shovel Co., Parkersburg, W. Va., will be glad to send on request.

A New Light-Weight Drag Scraper

114 Complete information in regard to the new Crescent drag scraper of 12-cubic yard capacity, a feature of which is that the weight of this new bucket is less than the 10-cubic yard standard model, may be secured by those interested from Sauerman Bros., 464 So. Clinton St., Chicago, Ill.

A Complete Line of Shovels, Spades and Scoops

115 Catalog No. 32 covering the complete line of shovels, spades and 113 scoops made by the Shovel Plant of The American Fork & Hoe Co., Shovel Division, 1623 Euclid Ave., Cleveland, Ohio, embodies not only complete detailed descriptions of the various grades, list number, sizes, etc., but also other valuable information which should be of real service to contractors. The illustrations are true to life reproductions of the True Temper products listed.

An Automatic Air-Control Valve

116 An automatic air-control valve which permits definitely limited quantities of air to pass at various pressures, the quantity varying directly as the pressure, is being manufactured by the Varnell-Waring Co., Philadelphia, Pa. It is designed to prevent waste of air in the operation of pneumatic jack hammers, paving breakers, pneumatic riveters and for other work involving air pressure.

A New Heavy-Duty Tractor

117 Cleveland Tractor Co., Cleveland, Ohio, will be glad to send to interested contractors complete information in regard to the new Cletrac 80, features of which are electric starting equipment, radiator guard, crankcase guard, front pull hook and 83 horsepower at the draw-bar.

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An Electric Backfill Tamper

118 The Jackson electric backfill tamper which delivers 1,800 heavy blows a minute for field use and is operated by a compact light weight gas electric power unit is described and illustrated in the literature of the Electric Tamper & Equipment Co., Ludington, Mich.

A Combination Drum and Capstan Car-Puller

119 A new drum and capstan car-puller for spotting a train load of aggregate cars uses a steel cable on the drum for handling a haul of 900 feet and under. For shorter pulls of less than 300 feet, the horizontal capstan is used with manila rope. This car-puller, which is made by the Fridy Hoist & Machinery Co., Mountville, Pa. and is described in its literature, is made in 10, 15 and 20-horsepower motor ratings for handling a train of 500 tons and under on a slight grade.

Improved Vertical Gas Engines Convertible to Diesels

120 An improved line of vertical 4-cycle gas engines covering an unusually wide power range in a variety of cylinder combinations recently has been announced by the Worthington Pump & Machinery Corp., Harrison, N. J. These engines are built with 1 to 8 cylinders and 30 to 150 horsepower per cylinder. These engines, described in literature which may be secured from the manufacturer, can be readily converted to diesels at moderate expense, if it becomes necessary or desirable to substitute oil for gas as a fuel.

A New Oversize Crawler Mounting for Draglines

121 Complete information in regard to the new oversize crawler mounting for the Bucyrus-Erie 52-B gas and diesel dragline which is designed to provide greater stability when the dragline is operated on soft bottom, may be secured by those interested from the Bucyrus-Erie Co., South Milwaukee, Wis.

An Oil Burning Jacketed Water Heater

122 Littleford Bros., 485 E. Pearl St., Cincinnati, Ohio, will be pleased to send an illustrated description of the LB oil burning jacketed water heater in which the water passes three times in close contact to the circular oil burner. This heater produces 300 gallons per hour at 175 degrees Fahrenheit for use as concrete mixing water in winter.

New Speed and Power for Pipe Handling

123 The Trackson Co., 1323 So. First St., Milwaukee, Wis., and the Highway Trailer Co., Edgerton, Wis., have jointly issued a folder on the new Trackson-Highway pipe layer which is a combination of the Trackson McCormick-Deering crawler tractor and the Highway boom for pipe handling.

Transits and Levels

124 A booklet on popular types of transits and levels in general use by engineers, surveyors and contractors and giving full information on the sizes and styles of these instruments may be secured by those interested from C. L. Berger & Sons, Inc., 37 William St., Roxbury, Boston, Mass.

Handling Material with Belt Conveyors

125 A booklet, "How Shall We Handle It?" has been issued recently by the Diamond Rubber Co., Inc., Akron, Ohio, in which conveyor belt problems in many industries, the advantages of the belt conveyor, details of belt construction and suggested applications, are discussed. This profusely illustrated booklet may be obtained on request to the manufacturer.

Additions to Truck Line

126 Reo Motor Car Co., Lansing, Mich., will be glad to send to those interested complete information in regard to two new models which were recently announced, a 6-cylinder Gold Crown engine 2-ton model and a new 8-cylinder 4-ton truck, both of which have a number of new and distinctive features.

A 9-Yard Carry-All Scraper

127 Literature describing the LeTourneau 9-yard carry-all scraper which is designed to pick up a large load and carry it in high gear, is of all welded steel construction, with an average capacity of 9 yards, may be secured by interested contractors from R. G. LeTourneau, Inc., Wilson Way and Roosevelt Ave., Stockton, Calif.

Rock Drills and Sharpeners

128 This is the title of a 32-page illustrated booklet covering the entire line of Ingersoll-Rand equipment for drilling rock and reconditioning drill steel as well as all accessory equipment and instructions for correctly heat treating drill steel. Copies of this catalog, Form 4101, may be secured by those interested from the Ingersoll-Rand Co., 11 Broadway, New York City.

An Asphalt Emulsion for Pavement Construction

129 Bitumuls H, an asphalt emulsion which is designed for the construction of economical, sound and easily-laid pavements, is described in Bulletin No. 3 which the American Bitumuls Co., 200 Bush St., San Francisco, Calif., will be glad to send on request.

Hydraulic-Controlled Motor Graders

130 Bulletin No. 136 issued by the Galion Iron Works & Mfg. Co., Galion, Ohio, describes and illustrates Galion motor graders with hydraulic power control and furnished with either McCormick-Deering, Cletrac or Case tractor power.

Protecting Concrete Corners with Metal

131 Armored Concrete, a construction composed of concrete and grey cast iron so bonded as to become an absolute mechanical unit and protect the stone from damage under impact, abrasion, corrosion, and temperature and moisture variations, is described in Catalog III and other literature of B. Nicoll & Co., Inc., 292 Madison Ave., New York City.

Diesel Engines for Construction Equipment

132 Complete information in regard to the Caterpillar diesel engine, which was developed for use in diesel tractors and which has recently been announced as a stationary unit for use in operating various types of construction equipment, may be secured by those interested from the Caterpillar Tractor Co., Peoria, Ill.

Rock, Sand and Cinder Crushing Machinery

133 New Holland rock, sand and cinder crushing machinery, including pulverizers, screens, elevators, conveyors and feeders as well as fully equipped crushing plants, are described in Catalog No. 32 which the New Holland Machine Co., New Holland, Penna., will be glad to send on request.

Addition to Line of Pumps

134 A complete description of the new Novo 2-inch self-priming centrifugal pump, which has recently been added to the line of Novo centrifugals and which has a capacity of 7,500 gph at a 15-foot lift and a total head of 55 feet, may be secured by interested contractors from the Novo Engine Co., 216 Porter St., Lansing, Mich.

All-Wheel-Drive Motor Trucks

135 Marmon-Herrington Co., Indianapolis, Ind., will be glad to send to those interested complete information in regard to the Marmon-Herrington Model T H-300-4, which has a rated capacity of 3½ to 4 tons, drive through both front and rear wheels, dual type rear wheels and is powered by a six-cylinder 94-horsepower engine.

Book on Steel Chains

136 An illustrated 144-page catalog describing the complete line of Link-Belt chains from the small detachable steel No. 25 size to the powerful chains with a strength of 1,500,000 pounds, and including roller chains, engineering chain, block-type and draw bench chain, balance chain, steel ice chain, drop-forged rivetless chain and others, may be secured by interested contractors and engineers who write to Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill., and request Book No. 1192.

A Gyrotary Rock Crusher

137 Bulletin No. 111 describing the Traylor Type BH gyrotary rock crusher, among the features of which are the Traylor bell head and curved concaves, a self-tightening non-stripping suspension nut, dust seal and positive and an entirely automatic lubrication system, may be secured by those interested from the Traylor Engineering & Mfg. Co., Allentown, Penna.

A Dragline Bucket for Use on Levees and Similar Jobs

138 The new improved Williams DL dragline bucket, which has a number of new features and improvements and which is specially designed for the severe service of levee construction, is described and illustrated in literature which the Wellman Engineering Co., 7012 Central Ave., Cleveland, Ohio, will be glad to send on request.

A New Centrifugal for General Pumping Service

139 Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass., in Bulletin D-45 describes the Type E Electropump, a compact, efficient, low-cost centrifugal for small and moderate capacities for operation against heads up to 150 feet, or 65 pounds in a single-stage unit, and designed for circulating hot and cold water, or brine, for water supply systems and booster service, low pressure boiler feedings, air conditioning apparatus, swimming pools, golf courses and general service.

A Front End Fresno Loader and Bulldozer

140 The Anthony multiple tool digger for Caterpillar Twenty-Five tractors is so built that with a simple interchange of parts it may be used as a front end Fresno, a wagon loader or a bulldozer. Further information, prices and complete description with illustrations may be secured from the Anthony Co., Inc., Streator, Ill.

A Modern Alloy for Culverts

141 "The Path to Permanence," second edition, issued by Republic Steel Corp., Youngstown, Ohio, discusses and illustrates the use of Toncan copper molybdenum iron known as Toncan iron for ducts, ventilators, roofs and the severe services of culverts.

A Full-Revolving Truck Crane

142 The Hyster truck crane, among the features of which are all steel construction, full circle swing, three hoisting speeds, three rates of rotation and a ½-yard bucket capacity, is described in Bulletin No. 206 which the Willamette-Ersted Co., Portland, Ore., will be glad to send on request.

Asphalt Paving Tools

143 Bulletin No. 6 A describing Iroquois asphalt paving tools, including tampers and smoothers, rakes, patching hoes, cutters, shovels, melting and pouring pots, stone and binder forks, patrol kettles, fire wagons, hand rollers and surface heaters, may be secured by those interested from the Barber Asphalt Co., Iroquois Dept., Philadelphia, Penna.

A Spray Outfit for Concrete Curing

144 The Aeroil power spray outfit designed for use in curing concrete roads, which is mounted on two 24-inch diameter rubber-tired wheels and is powered by a 2½-horsepower air-cooled gasoline engine, is described in literature which interested contractors may secure from the Aeroil Burner Co., Inc., West New York, N. J.

A New Heavy-Duty Elevating Grader

145 The new Adams elevating grader No. 11 which has a new frame, front axle and plow beam design, a 48-inch carrier with both the carrier and plow controls power-operated, is fully described in literature which the J. D. Adams Co., Indianapolis, Ind., will be glad to send on request.

A New 2-Inch Centrifugal Pump

146 A complete description of the new Marlo 2-inch self-priming pump, designed on the same lines as the larger Marlo pumps and which weighs only 110 pounds, has a capacity up to 80 gpm, suction lifts up to 25 feet and total suction and discharge up to 30 feet, may be secured from Marlow Pumps, Ridgewood, N. J.

Rust-Proof Hose Couplings

147 Super strength Bost hose couplings which are designed for durability, long life and economy and which are rust-proof are described in literature which the Goodall Rubber Co., Philadelphia, Penna., will be glad to send on request.

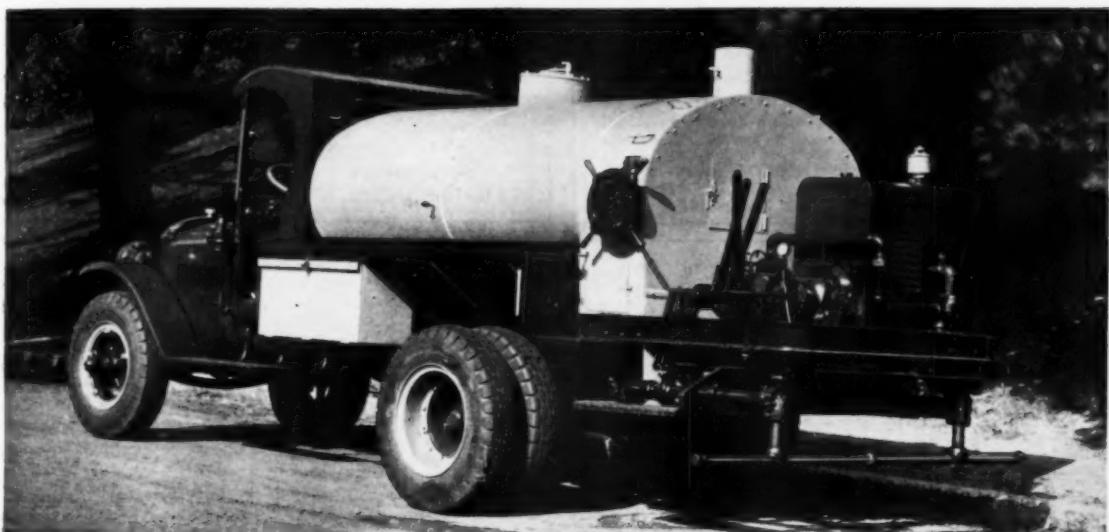
Estimating Chart for Waterproofing Materials

148 An estimating chart of Sonneborn products for water and damp-proofing floors, concrete structures and similar purposes may be secured by interested contractors from L. Sonneborn Sons, Inc., 88 Lexington Ave., New York City.

Hydraulic Dredges and Dredging Equipment

149 Ellicott Machine Corp., Baltimore, Md., will be glad to send to those interested its literature describing and illustrating Ellicott hydraulic dredges and dredging machinery of all sizes and types to meet the various requirements of contractors engaged in this type of work.

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LEE H. WILLIAMSON <i>Consulting Engineer</i> Water Supply, Sewage Disposal, Valuation and Rates, Industrial Plants Charlottesville, Virginia	ELMER E. BARNARD <i>Consulting Engineer</i> Assoc. M. Am. Soc. C. E. 508 Law Building LYNCHBURG VIRGINIA	MOTT CORE DRILLING CO. <i>Diamond Core Drill Contractors</i> Foundation Test Borings for Bridges, Buildings, Dams and all kinds of Mineral Prospecting. Large Diameter Holes Drilled for all Purposes. Main Office Huntington, W. Va.	ROBERT CRAMER <i>Consulting Engineer</i> Sewage Disposal Plants and Sewage Systems Utilization and Disposal of Industrial Wastes. Power Plants Design, Construction, Operation, Laboratory Service, Valuations and Reports. 847 W. Virginia Milwaukee, Wis.
GEORGE C. STONE <i>Consulting Engineer</i> Assoc. M. Am. Soc. C. E. Estimates; Design; Supervising; Industrial; Municipal Reports; Appraisals; Personal Representation. Masonic Temple Danville, Va.	Southern Drilling Co. <i>Diamond Core Drill Contractors</i> Foundation Testing for Buildings, Bridges and Dams. Exploration and Development of Coal and Mineral Properties SALTVILLE, VIRGINIA	J. PAUL BLUNDON <i>Consulting Engineer</i> Streets and Roads—Water Works Sewerage—Sewage Disposal Valuations—Rates Keyser, W. Va.	WALTER F. REICHARDT <i>Mem. Am. Soc. C. E.</i> <i>M. A. I. M. E.</i> <i>Consulting Engineer</i> Pavements, Highways, Sewerage, Water Supply, General Municipal Problems Reports Specifications Supervision Watertown Wisconsin

CONSULTING ENGINEERS

not already represented in this directory can secure rates for these cards and further particulars of our service by writing to—
Advertising Department

CONTRACTORS AND ENGINEERS MONTHLY

470 FOURTH AVENUE

NEW YORK, NEW YORK



TESTING LABORATORIES



The Picard Laboratories Chemists and Inspecting Engineers Inspection of Cast Iron Pipe, Structural Steel, Cement, Railroad Equipment, Creosoted Lumber, etc. Chemical Analyses of all Kinds Representation in all Principal Cities Clark Bldg. BIRMINGHAM, ALA.	PATZIG TESTING LABORATORIES <i>Inspection Service</i> Chemical and Physical Testing of Paving and Building Materials, Metals, Fuels, Oil, Water, Etc. 210 Eleventh St. Des Moines, Iowa	PEASE LABORATORIES, INC. Chemists—Biologists—Sanitarians Water Analysts and Technical Field Consultants 39 W. 38th St. New York	TOLEDO TESTING LABORATORY <i>Consulting Chemical Engineers</i> Roads, Pavements, Bridges and Buildings, Inspections, Tests, Reports, Specifications, Design and Control of Concrete and Asphalt Mixtures. 1912 Limwood Ave. Toledo, O.
Chicago Testing Laboratory, Inc. and affiliated Chicago Paving Laboratory, Inc. Hugh W. Skidmore Gene Ahola MATERIALS—PROCESSES STRUCTURES Consultation, Inspection, Testing, Design, Research, Investigation. 836 Lake Shore Drive Chicago	HOWARD INSPECTING and TESTING LABORATORIES Materials of construction of pavements, sewers, bridges, concretes. Concrete cores drilled. 43 years' experience. Write for rates. Expert investigations including pavement patents. 234 Mt. Prospect Ave. Newark, N. J. Phone: Branch Brook 2-4873	STILLMAN & VAN SICLEN Incorporated Chemical and Highway Engineers Analyses and Tests of Asphalt Paving Materials, Bitumens, Road Oils, Cement and Concrete. Specifications and Plans Drafted. Investigations, Reports and Inspection Service. Core Borings. 227 Front St. New York City	OKLAHOMA TESTING LABORATORIES <i>Inspection—Testing—Analyses</i> Cement, Aggregates, Concrete, Steel Bituminous Mixes and Materials, Paints and Creosoted Timber, Waters, Etc. 1145 NW Second St. L. D. 504 OKLAHOMA CITY, OKLAHOMA
WALTER H. FLOOD & CO. <i>Chemical Engineers</i> Paving and Engineering Materials—Inspections—Reports—Specifications—Physical and Chemical Tests—Design and Control of Asphalt and Concrete Mixtures. 622 E. 42nd St. 321 Daniel Bldg. Chicago, Ill. Jackson, Miss.	NEW YORK TESTING LABORATORIES <i>Chemical & Physical Tests, Microscopical Examinations</i> Electrical Tests, Power Plant Tests, Expert Inspections, Cities and Industries. 80 Washington St. New York City	H. C. Nutting Company <i>Inspecting and Consulting Engineers</i> Chemical Analysis, Physical Test, Highway, Paving, Bridge and Building Inspection, Test Borings, Specifications, etc. ELMWOOD PLACE STATION CINCINNATI OHIO	"Turn over a new leaf" every now and then, but don't turn over leaves so fast that you miss seeing pages 43 and 44.

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Let us know where. We want you to continue receiving CONTRACTORS AND ENGINEERS MONTHLY promptly. Use the coupon below in notifying us.

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470 Fourth Avenue, New York

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City and State _____

**Contractors
and
Engineers
Monthly**

**DIRECTORY
OF
EQUIPMENT
DISTRIBUTORS**

The following cards (arranged by state) show the names of dealers in contractors' equipment and supplies, with a record of the various lines handled. Canadian cards appear on page 69.

ALABAMA—ARKANSAS

C. B. DAVIS ENGINEERING CO.
Brown Marx Bldg. Birmingham, Ala.

Representing

ROBINS—Belt Conveyors and Screens
ALDRICH—Power Driven Pumps
FOSTER-WHEELER—Pulverized Coal Equipment, Superheaters, Condensers and Boilers.
LO-HED—Electric Hoists
INDUSTRIAL BROWNHOIST—Locomotive Cranes
CLEVELAND—Cranes
WHITCOMB—Locomotives

TURNER SUPPLY COMPANY
N. W. Corner of St. Louis & Commerce Sts.
MOBILE ALABAMA

Representing

McKERNAN-TERRY CORP.—Pile Hammers
INDEPENDENT PNEUMATIC TOOL CO.—“Thor” Tools and Compressors
WILLIAMS—Clamshell and Dragline Buckets
ORR & SEMBOWER—Concrete Mixers & Hoists
AMERICAN STEEL & WIRE CO.—“Monitor” Wire Rope
DOMESTIC—Pumps and Hoists
WYOMING SHOVEL CO.—Red Edge Shovels, Scoops
LINK-BELT CO.—Crawler Cranes, Shovels, Loaders
WESTERN WHEEL SCRAP-EN CO.—Wheeler, Drags, Scrapers, Fresnos, Ploughs
BATES—Bar Tie
JAEGER-LAKEWOOD—Concrete Mixers, Paving Equip., Chuting Equip.
BEIBE BROS.—Hoists and Saws

RONSTADT HARDWARE & MACHINERY CO.

“Pioneers in Good Merchandise”

TUCSON ARIZONA
GALION Graders, Rollers, etc.
McCORMICK-DEERING Industrial Tractors, Engines
INTERNATIONAL Motor Trucks
BAY CITY Shovels, Cranes, Draglines
ORD Concrete Finishing Machines
MUNICIPAL Sprinklers, Flushers, etc.
STERLING Hoists, Contractors' Pumps
AMERICAN “Trulay” Wire Rope
SPARROW Oil Distributors
BROOKVILLE Locomotives
POMONA Turbine Pumps
MYERS Pumps

G. C. PHILLIPS TRACTOR Co., Inc.
1625-31 Ave. B. So. Birmingham, Ala.

Representing

ALLIS-CHALMERS Tractors
BAKER “Baker Maney” Self-Loading Scrapers
BEYERS Full-Revolving Shovels and Cranes
CHAIN BELT “Rex” Mixers, Pavers, Pumps, Saw Rigs, Etc.
DIXOYL Lubricating Greases
GALION Road Graders and Machinery
HAISS Loaders and Conveyors
HEIL Hoists and Bodies
HERCULES Engines
HVAAS Heavy Duty Trailers
IOWA Screening and Crushing Plants
TOLEDO Torches
TRACKSON Crawlers, Shovels and Hoists
Member: Associated Equipment Distributors

Arizona Tractor & Equipment Co.
238 W. Jefferson St. Phoenix, Ariz.

Representing

“CATERPILLAR” Tractors
“CATERPILLAR” Road Machinery
ATECO Dirtmovers, Bulldozers, Tamping Rollers and Scarifiers
ATHAY True Wheels
BUFFALO-SPRINGFIELD Rollers
DAY Crushers
HEIL Hoists
KILLEFER Road Tools
LA PLANT-CHOATE Snow Plows
LITTLEFORD Asphalt Equipment
PACIFIC Wire Rope
SPEEDER Shovels
WILLAMETTE-ERSTED Hoists
EUCLID Earth Moving Equipment

ARKANSAS FOUNDRY COMPANY
IRON AND STEEL

Little Rock Arkansas

Representing

AMERICAN STEEL & WIRE CO.—Wire Rope and Cable
NATIONAL STEEL FABRIC CO.—Wire Mesh
MILWAUKEE CORRUGATING CO.—Lath and Building Products
MAJESTIC CO.—Coal Chutes and Building Products
IRVING IRON WORKS—Subway Grating
CARTER BLOX-ON-END FLOORING CO.—Industrial Wood Flooring
LINDE AIR PRODUCTS CO.—Purox Welding and Cutting Equipment
DETROIT STEEL PRODUCTS CO.—Fenstra Steel Sash and Hollow Roof
SAINO MANUFACTURING CO.—Automatic Fire Doors
Also Structural and Reinforcing Steel and Steel Building Products

SMITH-PITTMAN TRACTOR CO., Inc.
Tractors and Road Machinery
520-26 No. 28th St. Birmingham, Ala.

Representing

“CATERPILLAR”—Tractors and Road Machinery
SPEEDER—Full Revolving Shovels, Draglines
EMPIRE—Cutting Edges, Wheelbarrows, Carts
EUCLID—Crawler Dump Wagons, Power Scrapers
ATLAS—Rotary Wheel-type Scrapers, Fresnos
LAKWOOD—Finishers, Sub-grading, Machinery
BLAW-KNOX—“Ball” Wagons, Graders
KILLEFER—Road Tools, Agricultural Implements
TOWERS & SULLIVAN—Agricultural Implements
LA PLANT-CHOATE—Wagons, Bulldozers, Scrapers

NEIL B. McGINNIS CO.
Box 2113 Phoenix, Ariz.

753 E. Jackson St.

Representing

Adams Leasing Wheel Graders
Jaeger Concrete Mixers, Pavers, Pumps, Hoists
Allis-Chalmers Tractors
Barber-Greene Conveyors and Loaders
Bremse Rippers & Scarifiers
Bully Back Fillers & Bulldozers
Erie Road Rollers
General Shovels, Cranes, etc.
Gardner - Denver Portable Compressors, Jack Hammers, etc.
Genco Spreaders
Huber Road Rollers

JOE LYONS MACHINERY CO.
Contractors' Equipment and Supplies

112 Louisiana St. Little Rock, Ark.

Representing

REX—Mixers and Pavers, Mortar and Plaster Mixers, Pumps and Saw Rigs
BLAW-KNOX—Curb, Gutter and Road Forms, Batchers, Bins, Clamshell Buckets, Truck Turntables
BARBER-GREENE—Conveyors, Loaders, Ditchers
RED STAR—Wheelbarrows, Concrete Carts
NOVO—Hoists, Etc.
UNION—Wire Rope
WAUKESHA-FULLER & JOHNSON—LEROI—Engines
BATES—Bar Tie
P & H—Power Shovels, Cranes and Draglines
Also Quarry & Gravel Plant Equipment

HAVE YOU CHANGED YOUR LOCAL ADDRESS?

Sometimes in the rush of moving to a new location you fail to send us your new address. And as we are anxious to get your copy of the magazine to you on time do not put off writing us. Thank you.

**CONTRACTORS AND ENGINEERS
MONTHLY**

470 Fourth Ave. New York

MINE & SMELTER EQUIPMENT CO.
Construction & Mining Machinery

306-12 South 7th Ave. Phoenix, Ariz.

Representing

LINK-BELT Shovels, Cranes and Draglines
LAKEWOOD Mixers, Concrete Placing Equip.
NOVO Hoists, Engines and Pumps
EDWARDS Wire Rope
STRAUB Milling Equip.
DIESEL Engines
GARDNER-DENVER Compressors, Rock Drills
HOBART BROS. Arc Welders

KERN—LIMERICK, Inc.
115 No. Spring St. Little Rock, Ark.

Representing

STOCKLAND Graders, Small Road Tools
JOHNSON Bins & Batches
HUBER Road Rollers
KOEHRING Pavers, Shovels
CEDAR RAPIDS Crushers, and Gravel Plants
T. L. SMITH Mixers and Pavers
INSLEY Mast Hoists, Building Towers
PARSONS Excavators and Backfillers
C. H. & E. Pumps, Saw Tables and Hoists
CLEVELAND Rock Drills, Air Tools, Etc.
RESILIFLEX Guard Rail
TRACKSON Crawlers, Hoists
LINN Tractors

For Canadian Distributors, see page 69

THE BROWN-BEVIS CO.

49th St. & Santa Fe Ave. Los Angeles, Cal.

Distributors

Archer Towers
Barney Pumps
Bay City Truck Cranes
Buckeye Tremont Machines
Burke Stone Spreaders
Carter Pumps
Wonder Concrete Mixers
Continental Engines
Eccentric Wagons & Scrapers
Plymouth Locomotives
General Shovels, Cranes
Member: Associated Equipment Distributors

Haus Loaders, Conveyors
Huber Gas Rollers
Lidgerwood Hoists, Cableways
Link Belt Shovels, Cranes
Littlefield Asphalt Heaters
Michigan 3/4yd. Shovels
Murtz-Bennett Shoulder Machines
Owen Dragline Buckets
Page Dragline Buckets
Williamsport Wire Rope

SHEPHERD TRACTOR AND EQUIPMENT COMPANY

514-20 West 12th St. Los Angeles, Calif.

Representing

“CATERPILLAR” Tractors
“CATERPILLAR” Road Graders
KILLEFER Scrapers, Scarifiers, Road Discs
ATECO Dirt Movers, Bulldozers, Scarifiers
ATHEN True Wheel Trailers
JUMBO Scrapers
LaPLANT - CHOATE Crawler Wagons, Bulldozers
MASTER Bulldozers, Trail Builders, Pipe Handling Equipment
WILLAMETTE Hyster Winches for Tractors

GARFIELD & CO.Construction Equipment
Hearst Building San Francisco, Calif.*Representing*

PLYMOUTH—Gasoline and Diesel Locomotives
LINK-BELT—Shovels, Cranes, Draglines
BAY CITY—Shovels, Cranes, Draglines
AUSTIN—Trenchers and Backfillers
LEACH—Mixers, Pavers, Saw Rigs
ROLLER BEAR—Rock Crushers
CLIMAX—Engines and Power Units
MUNDY—Hoists and Derricks

CONCRETE MACHY. & SUPPLY CO.

777 E. Gage Ave. Los Angeles, Calif.

Representing

AMERICAN Cable
BROOKVILLE Gasoline Locomotives
BUTLER Bins & Batching Tractors
BUCHTHUS-ERIE Shovels and Cranes
CLYDE Hoists & Derricks
GARDNER-DENVER Compressors
HANDY Sack Cleaners and Bins
TRACKSON Crawlers, Shovels and Heavy Duty Trailers
Member: Associated Equipment Distributors

HOMELITE Pumps and Generators
HOTCHKISS Road Forms
INTERNATIONAL Industrial Plants
LE ROI Engines
MURRAY Excavating Mchys.
REX Mixers and Pavers
REX Pumps and Saw Tables
RED STAR Wheelbarrows and Carts
SERVICED Expan. Joints
STEINS Elev. & Conveyors
WILLIAMS Buckets and Heavy Duty Trailers

Smith Booth Usher Co.

2001 Santa Fe Ave. Los Angeles

228-238 Central Ave.

BARBER-GREENE — Ditchers, Excavators, Loaders
CEDAR RAPIDS—Crushing Plants
EASTON—Industrial Cars
FOUR WHEEL DRIVE—FWD Trucks
FREEMAN—Turntables
GALION—Graders, Rollers
HERCULES—Power Units
JAEGER — Mixers, Hoists, Pumps, Tower Equipment
JOHNSON—Bins, Hoppers
LAKEWOOD—Road Finishers, Forma, Chuting, etc.
CLEVELAND Crawlers/Tractors
Member: Associated Equipment Distributors

MACWHYRE—Wire Rope
MOHAWK—Asphalt Heaters
MULTIFOOTE—Pavers
MUNDY—Hoists
SAUERMAN—Cableway Excavators, Power Drag Scrapers
SCHRAMM—Compressors
SIMPLEX—Trench Boxes
SKILSAW—Portable Electric Saws
THEW—Shovels and Cranes
UNION IRON WORKS—Pile Driving Hammers
UNIVERSAL—35" Shovels and Cranes

JENISON MACHINERY CO.

20th & Tennessee Sts., San Francisco

Representing

Barber-Greene Co.
Barnes Road Pumps
Berg Finishers
Butler Bin Co.
Carbide Mfg. Co.
Carter Humidifier Pumps
Chicago Pump Co.
Cleveland Tractor Co.
Continental Motors Corp.
Galion Iron Wks. & Mfg. Co.
Hercules Products Co.

Leadmaster Cranes
Morris Machine Works
Orton Crane & Shovel Co.
Rosen Mfg. Co.
Sauerman Bros. Inc.
Smith Eng. Works
Sterling Pump Works
Superior Engine Co.
Willitt Mfg. Co.
Wolf Timber Saws

Member: Associated Equipment Distributors

CROOK COMPANY

2900 Sante Fe Ave. Los Angeles, Calif.

Southern California Distributors

Allis-Chalmers — Tractors
Davis Mfg. Co. — Hydraulic Scraper
Bremers Co. — Scarifiers, Road Rippers, Implements
Osgood Co. — Shovels, Cranes, Hoes
Buffalo-Springfield Co. — Rollers
Hetzell Steel & Iron Co. — Bins, Batching, Road Forms
Nevco Engine Co. — Engines, Hoists, Pumps
Morton — Scrapers, Dirt Movers
Sullivan Machinery Co. — Air Compressors
Mack Wooldridge Co. — Backfillers, Bulldozers
D-A — Lubricants

WE WOULD LIKE TO HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York

GARLINGHOUSE BROS.

2416 E. 18th Street, Los Angeles, Calif.

Southern California Distributors for
BLAW-KNOX & WESTERN PIPE CORP.—Road Building Equipment, Steel Forms, Ord Road Finishers, Indus. Equipment, Steel Grating, etc.
BROWNING CRANE & SHOVEL CO.—Shovels, Cranes
DOMESTIC ENG. & PUMP CO.—Road Builders & Dewatering Pumps
RANSOME CONCRETE MACHY. CO.—Conc. Placing Eq. Concr. Mixers, Pavers, Pneu. Concr. Placers, Grouters
A. LESCHEN & SONS ROPE CO.—Wire Rope
MCKIERNAN-TERRY CORP.—Pile Hammers, Lumber-National Hoists, Cableways, Whirlies
WORTHINGTON—Portable Compressors, Jackhammers, etc.
MALL TOOL CO.—Concrete Surfaces
DOBBIE—Derrick & Derrick Fittings
Member: Associated Equipment Distributors

EDWARD R. BACON CO.

Folsom at 17th St. San Francisco
Adams Graders
Burke Stone Spreaders
Byers Shovels and Cranes
Cedar Rapids Crushers
Cleveland Trenchers
Dobie Winches and Derricks
Easton Industrial Cars
Freeman Turntables
Hercules Power Units
Homelite Pumps
Huber Rollers
Jaeger Concrete Mixers
Johnson Bins and Batching
Lakewood Finishers
Member: Associated Equipment Distributors

Lidgerwood Hoists
Midwest Locomotives
McKernan-Terry Pile Hammers
McCormick-Deering Tractors
M & M Wire Clamp Co.
Multi Foot Road Pavers
Northern Conveyors
Ohio Loco. Cranes and Tractor Dump Wagons
Schramm Air Compressors
Templeton Kenly Jacks and Trench Braces
Toledo Torches and Hoses
Trackson Crawler Tractors

KRATZ & McCLELLAND, Inc.522 Bryant St. San Francisco, Calif.
Northern California Distributors

Ransom Concrete Machy. Co.—Pavers, Mixers, Towers, Chuting
Nove Engine Co.—Engines, Hoists, Pumps, Lighting Units
Chausse Oil Burner Co.—Portable Asphalt Plants, Kettles, Surface Heaters
Greyhound—Contractor Portable Saws
Milwaukee Locomotive Co.—Gasoline Locomotives
Spader Machy. Corp.—Shovels, Cranes, Draglines
Hetzell Steel Form & Iron Co.—Bins, Batching & Road Forms
Ames Iron Works—Gasoline Road Rollers
Union Iron Works, Inc.—Pile Hammer & Foundation Equip.
Automix, Inc.—Motor Truck Concrete Mixers
Grimm Ditcher Co.—Ditchers and Track Supporters
Fischer & Hayes Rope & Steel Co.—Concrete Form Devices
N. P. Nelson Iron Works—Loaders & Conveying Equipment

LOOK THIS DIRECTORY OVER CAREFULLY

If you find any errors while checking over this directory will you please advise us at once, because it is our desire to keep it accurate and up-to-date at all times.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York

NORRIS K. DAVIS, INC.

400 Seventh St. San Francisco, Calif.

Representing

LE ROI CO.—Gasoline Power Units
MINNEAPOLIS STL & MACHY. CO.—Twin City Engines
ARCHER IRON WORKS—Concrete Placing Equipment
DAVIS CO.—Mixers, Hoists, Motor Truck Concrete Transferring Systems, Readymix Concrete Plants
DIAMOND IRON WORKS—Saw Mill, Rock Crushing, Screening, Conveyor and Transmission Machinery
HANSON CLUTCH & MACHY. CO.—Excavators
O. K. CLUTCH & MACHY. CO.—Hoists, Air Compressor
KEYSTONE DRILLER CO.—Shovels, Skimmers, Pulverizers, Well Drilling Machy., Tools

ELTON T. FAIR CO.

1611 Wazee St. Denver, Colo.

Representing

J. D. Adams Co.
Pioneer Gravel Equip. Mfg. Co.
D-A Lubricant Co., Inc.
Madsen Iron Wks.
Davey Compressor Co.


INDUSTRIAL & CONSTRUCTION EQUIPMENT

U. S. National Bank Building, Denver, Colo.

P&H Shovels, Cranes, Draglines, Trench Machines
NORTHERN Portable and Stationary Conveyors
PLYMOUTH Gasoline and Diesel Locomotives
ARCHER Steel Tower & Concrete Distributing Systems
OWEN Clamshell Buckets
OHIO Locomotives, Cranes
ERIE Aggregater Plants
McKERNAN-TERRY Pile Hammer
GRUENDLER Crushing and Screening Plants
HIGHWAY 34-8 Wheel Trailers
PAGE Dragline Buckets

DIRECTORY OF DISTRIBUTORS

COLORADO—GEORGIA

Hendrie & Bolthoff Mfg. & Supply Co.
Established 1861
1635 Seventeenth St. Denver, Colo.
Representing
AMERICAN—Contractors Saw Tables
AMERICAN—Hoists, Derricks and Steam Shovels
BARBER ASPHALT CO.—Roofing and Asphalt Products
BEERE BROS.—Hand Winches
MASTER & WONDER—Concrete Mixers
CLIMAX—Gasoline Power Units
GARDNER-DENVER—Pumps, Air Compressors and Drills
GENERAL ELECTRIC—Motors and Appliances
NOVO—Engines and Hoists
ROEBLING—Ropes and Wires
SKILSAW CORP.—Saws
UNIVERSAL—Crushers
WYOMING—"Red Edge" Shovels

HERBERT N. STEINBARGER CO.
Construction Equipment
1640-1646 Wazee St. Denver, Colo.
Distributors
BUCKYER-ERIE Steam, Gas, Diesel and Electric Shovels
Draglines and Cranes
VULCAN Steam and Gasoline Locomotives
DIAMOND Crushing, Screening Plants
ERIE Clamshell Buckets, Bins, Weighers
SAUERMAN Power Scrapers, Cableway Excavators
AUSTIN Trenching Machines, Backfillers
STERLING Hoists, Pumps
KNICKERBOCKER Concrete Mixers
MULTI-FOOTE Paving Mixers
BUFFALO-SPRINGFIELD Road Rollers
BUHL Portable Compressors
HARDSCOG Drills and Pavement Breakers

The K. B. NOBLE CO.
C O N N E C T I C U T
REPRESENTING AMONG OTHERS
GALION Gasoline Rollers, Road Graders, Scrappers.
BYERS Shovels, Cranes, etc.
HELTZEL Bins and Batches
LAWRENCE Pumps
SULLIVAN Compressors
LIDGERWOOD MFG. CO.
CHICAGO AUTOMATIC CONVEYOR CO.
Member:
Associated Equipment Distributors
HARTFORD, CONNECTICUT

THE GESNER EQUIPMENT CORP.
254 Park St. New Haven, Conn.
Representing
Jaeger Machine Co.
Northern Conveyor & Mfg. Co.
De Walt Products Co.
Schramm, Inc.
Cleveland Rock Drill Co.
Marion Steam Shovel Co.
Lakewood Eng. Co.
Economy Steels and Bits
Complete Rental Stocks

Power Equipment & Service Inc.
109 Water Street New Haven, Conn.
CONN. DISTRIBUTORS
COLDWELL Power Mowers
RODERICK LEAN Scrapers
ROME Road Machinery
OLIVER Implements
SARGENT and WALSH Snow Plows
CLETRAC Crawler Tractors
HART-PARR Tractors
MARLO Pumps
DETROIT Street Sweepers
CHICAGO Pneumatic Compressors

THE HENRY H. MEYER CO.
110 S. Howard St., Baltimore, Md.
628 Munsey Building, Washington, D. C.
Representing

Blaw-Knox Co.
Boston & Lockport Block Co.
Byers Machine Co.
Philip Carey Co.
Chausse Oil Burner Co.
Clyde Iron Works Sales Co.
Connery & Co., Inc.
Domestic Engine & Pump Co.
Dobie Foundry & Machine Co.
Duff-Norton Mfg. Co.
Galloway Iron Works & Mfg. Co.
A. B. Farquhar Co., Ltd.
Member: Associated Equipment Distributors

JULIEN P. BENJAMIN, Inc.
21 N. Ocean St. Jacksonville, Fla.
Representing
McKiernan-Terry Corp.
Barber-Greene Co.
Aeroll Burner Co.
Sauerman Bros., Inc.
Holtzel Steel Form & Iron Co.
Standard Conveyor Co.
National Colortype Co.
Huber Rollers
Lambert-National Hoisting Engines
Owens Buckets
Rosco Distributors
Schramm Compressors
Lewis-Shepard Company
Steel & Conduit
Link-Belt Cranes
Rome Graders

FARQUHAR MACHINERY CO.
Mill Supplies and Machinery
720 W. Bay Street Jacksonville, Fla.
Representing
AMERICAN "BOSS" Concrete Mixers
CARBIC Flare Lights, Welding Equipment
CRESCENT Saw Tables and Woodworkers
FARQUHAR Engines and Boilers
GOULD'S-MYERS Pump Pumps
JACKSON Wheelbarrows, Concrete Carts
LINK-BELT Chain Sprockets, Drives
NOVO Gearbox Engines
NOVO Hoists, Single and Double Drum
NOVO Power, Diaphragm & Road Pumps
PLYMOUTH CORDAGE CO. Rope and Twine
SASGEN Derrick Equipment
SILVERSTRAND Wire Ropes, Accessories
TOLEDO Steel Torch Lights
STRUCTURAL STEEL Plain and Fabricated
Full Line of Industrial Supplies

M. D. MOODY
ACL No. 2—Sect. 1, Riverside Viaduct
Jacksonville, Florida
Representing

J. D. Adams & Co.
American Casting Co.
American Mfg. Co.
American Tar Products Co.
Buffalo-Springfield Roller Co.
Cyclone Fence Co.
The Elgin Corporation
E. D. Elmyre & Co.
De Walt Products Co.

Chas. Hiviss Co.
Littleford Brothers
Lakewood Engineering Co.
Mead-Morrison Mfg. Co.
Rawn Mfg. Co.
Page Engineering Co.
Freeman Mfg. Co.
Domatic Engine & Pump Co.
Allis-Chalmers Mfg. Co.

D. E. FISHBACK
ORLANDO FLORIDA
Representing
Fairbanks, Morse & Co., Oil Engines, Pumping Machinery
Electric Motors, Home Light and Water Plants
Jaeger Machine Co., Concrete Mixers, Road and Trench
Pumps, Hoists, Etc.
Cincinnati Rubber Co., Dredging Sleeves, Suction and Dis-
charge Hose
American Saw Mill Mfg. Co., Portable Woodworkers,
Saw Benches, Etc.
Gould's Pumps Inc., Power, Diaphragm and Hand Pumps
Cement Block Machines Co., "National" Concrete Block
Machines
Chicago Pneumatic Tool Co., Portable and Stationary Air
Compressors, Lift Pumps, Pipe, Valves and Fittings
STOCK CARRIED IN ORLANDO

McDONALD TRACTOR EQUIP. CO.
2303 N. Orange Ave. Orlando, Fla.

Representing
Caterpillar Tractor Co.
"Caterpillar" Graders
Athey Truss Wheel Co.
Barnes Manufacturing Co.
Blaw-Knox Company
P & H Cranes
LaPlante-Choate Mfg. Co.
Detroit Harvester Co.

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 LINK BELT Cranes, Shovels Shovels
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 ERIE—Rollers chors
 ESSICK—Plated Mixers RAY-SIGNS—Traffic Signs
 HOTCHKISS—Steel Forms ROGERS—Trailers
 HUG—Road-builders Trucks, ROTARY—Snow Plows
 Sub-builders SARGENT—Snow Plows
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SCHRAMM—Air Compressors
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DIAMOND—Crushing & Screening Equipment
WILLIAMSFORT—Wire Rope
SASGEN—Derricks
HELTZEL—Bins, Forms & Batches
NELSON—Spreader Ties
BALDWIN—Shovels, Scops
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Euclid Road Machinery Co.
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LA CROSSE Tv-Way Trailers
LITTLEFORD Asphalt Heaters and Tools
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DOMESTIC
ERIE (Bins)
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LA. PLANT-CHOATE CO.—Hydraulic Bulldozers, Plows,
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THE MECHANICAL SUPPLIES CO.
205-207 Vine St. Cincinnati, Ohio
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NOVO—Gasoline Engines, Hoists, Pumps, etc.
WORTHINGTON—Air Compressors, Rock Drills, Paving
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GENERAL—Excavators and Shovels
JAEGER—Truck Concrete Mixers
KILLEFER—Road Rippers and Rooters, Road Discs, Scrap-
ers, etc.
SUPERIOR—Weighing Batches
NORTHERN—Conveyors, etc.
JONES-SUPERIOR—Portable Saw Tables, etc.
COLUMBUS—Elevators and Conveyors

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Huber Mfg. Co.
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CLEVELAND Rock Drill Air Tools
DAVEY Air Cooled Compressors
COMPRESSOR Rental Service
TRACKSON Crawler Tractor, Hoists & Shovels
BLAIRE Hydraulic Diggers
WARCO Semi Crawlers
BAY CITY Shovels
ROTARY Scrapers
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BARNES MFG. CO.—Pumps
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BROWN HOIST CO.—Hoisting Engines
MILWAUKEE CRANE & HOIST CO.—Hoist Cranes and
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OHIO Locomotive Cranes
JOS. F. KIESLER—Clam Shell Buckets

THE W. M. PATTISON SUPPLY CO. 777 Rockwell Ave. Cleveland, Ohio

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Homelite Corp.—Portable Pumps, Generators and Blowers
Jaeger Machine Co.—Concrete Mixers and Towers
Littleford Bros.—Asphalt Heaters, Tools and Oil Burners
Orr & Sembower, Inc.—Electric and Gasoline Hoists, Boilers
Patent Scaffolding Co.—Scaffolding Equipment
Sager Derrick Co.—Derricks, Winches
Gustav Schaefer Co.—Automatic Fences
Wall Ropes Works—High-Grade Manila Rope
Wickwire-Spencer Steel Co.—Wire Rope
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Bebe Bros.—Hand Hoists, Wrecker Cranes, Electric Jig Saws

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Pope Salt Spreader and Ice Melter
Traffic Signals, etc.
Rebuilt Trailers of All Kinds
Municipal Equipment
Storage

SMITH & ELLIOTT, INC.

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SPEEDER MACHINERY CORP.—Shovels
Cranes and Draglines
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CLEVELAND ROCK DRILL CO.—Rock Drills,
Paving Breakers and Drill Steels
HOMELITE CORPORATION—Portable Centrifugal Pumps, Lighting Plants and Blowers

J. FRANK ROLLINGS

"The Crane Man"

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Representing

THE OHIO POWER SHOVEL CO.
Shovels, Cranes, Drag Lines
THE OWEN BUCKET CO.
Clam Shell Buckets
REX Concrete Mixers
SCHRAMM Air Compressors

Telephone—Evergreen 3359

C. L. STITH COMPANY

305 Franklin Bldg. Columbus, Ohio

Representing

FOOTE CO.—Paving Mixers
HELTZEL STEEL FORM & IRON CO.—Forms, Bins,
Batcher Plants
HUBER MFG. CO.—Gasoline Rollers
JAEGER MACHINE CO.—Concrete Mixers, Pumps, Hoists
LAKEWOOD ENGINEERING CO.—Paving, Building and
Industrial Equipment
FLEXIBLE ROAD JOINT MACHINE CO.—Compressed
Joint Machine
LITTLEFORD BROS.—Tar and Asphalt Kettles
CLEVELAND ROCK DRILL CO.—Rock Drills, Paving
Breakers
McCLOSKEY TORCH CO.—Bombshell Torches
OWEN BUCKET CO.—Clamshell Buckets
SASGEN DERRICK CO.—Derricks, Winches

W. T. WALSH EQUIPMENT CO.

12500 Berea Road Cleveland, Ohio

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BUTLER BIN CO.—Bins and Batchers
"CATERPILLAR" Tractors
GARDNER-DENVER CO.—Compressors and Air Tools
"GYRO-CENTRIC" Crusher
HUBER MFG. CO.—Road Rollers
JAEGER-LAKEWOOD Equipment
MCKIERNAN-TERRY CORP.—Pile Hammers
LAMBERT-NATIONAL DIV.—Hoisting Engines
PIERCE EQUIPMENT CO.—Pierce "Bear" Rollers
ROSCO MFG. CO.—Rosco Distributor, Oilier
WELLMAN ENGINEERING CO.—Williams Buckets
WHITE MFG. CO.—Chamotte-White Asphalt Plants, Heaters

Tel.: Lakewood 1024

THE TAYLOR TRACTOR CO.

285 Cozzens St. Columbus, Ohio

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Machinery and Harvesters
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LaPlant-Choate Mfg. Co.
Novo Engine Co.
Athey Truss Wheel Co.
Killefer Manufacturing Corp.
Baker Manufacturing Co.
Euclid Road Machinery Co.
Willamette-Erated Co.
Blaw-Knox Co. (Atco Div.)
All Steel Products Mfg. Co.

McNEILLY MACHINERY CO.

337 South High St. Columbus, Ohio

Representing

Austin Machinery Corp.—Trenching Machines, Back-
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Link Belt Co.
Electric, Gasoline Cranes,
Shovels and Draglines
Blystone Mfg. Co.
Concrete, Mortar and Plaster
Mixers
Dobbs Fly. & Mfg. Co.
Derricks and Piling
Owen Bucket Co.—Clamshell
and Digging Buckets

Moretrench Corp.—Wellpoint
Systems, Pumps
McKernan-Terry Corp.
Pile Hammers, Lambert-
National Hoisting Engines
Sager Derrick Co.
Derricks, Winches, etc.
Barne Mfg. Co.
Pumps
Chain Belt Co.
REX Mixers and Pavers
Gardner-Denver Co.
Air Compressors, Tools
Continental Rubber Works—
Air Hose, Suction Hose

THE W. W. WILLIAMS CO.

835 West Goodale St. Columbus, Ohio

Dayton

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Parsons Co.
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The Sterling Motor Truck Co.
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Blaw-Knox Co.
S. Flory Mfg. Co.
Iowa Mfg. Co.
McCormick-Dearing Industrial Tractors
The Buhl Co.

The Osborne & Sexton Machy. Co.

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Ohio Valley Machinery Co.

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Wonder Mixers and Pumps
Miles Block Machines
Pulsmeter Steam Pumps

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Oilmast Platform Trailers
Hayward Clamshell Buckets
Archer Concrete Towers and Clouting Plants
Marsh-Capron Mixers
Mario Mud and Water Pumps
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Berg Concrete Surface
Williams Trailers
Jaeger Pumps
Bates Wire Ties & Tying Tools

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Jaeger Truck Mixers
Lakewood Material Towers
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—Four-Wheel Drive Trucks
—Shovels, Drag Lines, Cranes
—Steel Mules
—Car Unloaders and Spreaders
—Drawn Road Graders
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—Culvert Pipe
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KILLEFER Scrapers and Road-Rippers
ATLAS Graders and Scrapers
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ROTARY Snow-Plows and Snow-Loaders
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“RED EDGE” Shovels
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LaPLANT-CHOATE Dump Wagons
ATHY Trailers
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BUCKRUS-ERIE Shovels
MULTIFOOTE Pavers
BUTLER Bits and Hoppers
HUG Dump Trucks
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DOMESTIC Pumps & Hoists
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BAKER Bulldozers
LINDE Carbic Lights
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PARKS Saw Rips
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EASTON Dump Bodies, Carts and Track
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INGERSOLL-RAND Compressors
REX Mixers, Pavers and Pumps
NORTHWEST Cranes and Shovels
ARCHER Tower and Spouting Equipment
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BAKER-MANBY Self Loading Scrapers
BUCKUS-ERIE Shovels and Cranes
CHICAGO-PNEUMATIC Air Compressors
DOMESTIC Pumps and Hoists
EUCLID Bulldozers
HUBER Road Rollers
HELTZEL Forms, Bins and Batchers
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Lakewood Engineering Co.
Sterling Wheelbarrow Co.
Jaeger Machine Company
Hetsel Steel Form & Iron Co.
Ingersoll-Rand Co.
Foote Co.—Pavers
Homelite Corp.—Pumps
Littleford Bros.
Universal Crushers
Theew Shovel Co.
Trackson Co. Crawlers, Hoists
McCormick-Deering Tractors
Cleveland Crawler Tractors

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Insley Shovels, Cranes
Koehring Pavers, Mixers
Smith Pavers, Mixers
Parsons Ditchers, Backfillers
Koehring Dumpers
Telsmith Crushers, Screens
Schramm Portable Compressors
Gardner Stationary Compressors
Orr and Sambower Hoists
C. H. & E. Saw Rigs
H & A Woodworking Machinery
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Haiss Loaders and Conveyors
Butler Bins
Williams Buckets and Heavy Duty Trailers
Red Star Barrows
Molly Shovels
Evinrude Pumps
Waugh Rock Drills
Black & Decker Electric Hammers
Black & Decker Electric Saws
Williamsport Wire Rope

CHOCTAW CULVERT AND MACHINERY COMPANY

Second & Butler Sts. Memphis, Tenn.

Representing

Jaeger Machine Co. Northwest Eng'g. Co.
Sterling Wheelbarrow Co. Steel Engineering Works
Littleford Brothers Clyde Iron Works
Buffalo-Springfield Roller Co. Saenger Derrick Co.
Lakewood Engineering Co. Gardner-Denver Co.
The Foote Co. E. D. Etnyre Co.
Owen Bucket Co. Drake-Williams-Mount Co.
Butler Bin Co. Le Rel Company
Beach Mfg. Co. Trackers Company
Bebie Bros.

Member: Associated Equipment Distributors

CLARK & BURROWS, Inc.
3600 Commerce St., Dallas, Texas

Representing

KOEHRING—Pavers, Mixers, Power Shovels, Cranes, Draglines, Dumpers
INSLEY—Excavators, Concrete Placing Equipment, Cars, Buckets, Derricks, Shoulder Finisher
T. L. SMITH—Tilting and Non-Tilting Mixers, Pavers
PARSONS—Trench Excavators, Backfillers, Trailers
C. H. & E.—Portable Saw Rigs, Pumps, Hoists
KWIK-MIX—Mixers, Concrete, Plaster and Mortar
C. S. JOHNSON—Material Storage Bins and Batchers
HERCULES—Rollers, Crawl Tractor Roller
METAL FORMS CORP.—"Metalforms"
CONSOLIDATED IRON-STEEL MFG. CO.—Cleveland
Road Torch
WORTHINGTON—Portable Compressors and Air Tools
A Complete Line of Construction Equipment

LEWTER F. HOBBS, INC.
"Any machine for the Contractor since 1906"
NORFOLK, VIRGINIA

KNICKERBOCKER Mixers
STROUDSBURG Hoists
CHICAGO Compressors
U. S. ASPHALT Plants
FAIRFIELD Conveyors
FARQUHAR Boilers
FREEMAN Turntables

Other Well Known Lines

NASHVILLE TRACTOR & EQUIPMENT CO.

322 Fifth Ave., S. Nashville, Tenn.

Representing

CATERPILLAR Tractors and GENERAL Wheelbarrows, Scraps and Bladers
Road Machinery
EUCLID Wagons & Scrapers
GARDNER-DENVER Air Compressors and Tools
SPEEDER Shovels & Cranes
LA PLANT-COATHE Bulldozers, Wagons & Scrapers
IOWA MFG. COMPANY Crushers, Plants, Mixing Plants
KILLEFER Scrapers

Power Shovels, Trucks, Wagons, Bins, Hoists, Pumps

Steel Products Corporation

750-760 First Natl. Bank Bldg.

P. O. Box 23

El Paso, Texas

Exclusive Distributors

CEDAR RAPIDS Crushers, Screening Plants, Washing Plants and Oil Road Mix and Pre-Mix Plants

CHAUSSE Asphalt Kettles

GRAHAM B. BRIGHT

1106 Electric Bldg. Richmond, Va.

Representing

Acme Road Machinery Co. Davey Compressor Co., Inc.
American Wire Fence Co. E. D. Etnyre & Company
Bay City Foundry & Machine Co. George Haiss Mfg. Company
The Parsons Company
The Byers Machine Co. MacWhye Company
J. C. Cleaver Company Milwaukee Locomotive Mfg. Co.
Eaton Car & Construction Co. Smith Engineering Works

Wilson-Weesner-Wilkinson Co.

Nashville Tennessee

NATIONAL EQUIPMENT CO.

Koehring Co. T. L. Smith Co. Ingersoll-Rand Co.
Insley Mfg. Co. Littleford Bros. McKiernan-Terry
Allis-Chalmers Mfg. Co. Corp. Western Wheeled
Blaw-Knox Co. Scrapers Co.
C. H. & E. Mfg. Co. Wyoming Shovel Works

Warehouse Stocks of Service

MURKIN—KNOXVILLE

MEMPHIS

Member: Associated Equipment Distributors

R. B. EVERETT & CO.

3112-18 Harrisburg Blvd. Houston, Texas

BLAW-KNOX Road Plant Equipment, Bins & Clam Shell Buckets
CHAIN BELT Concrete Mixers, Pumps, etc.
CLYDE Hoisting Machy. "P. & H." Gasoline Cranes
UNIVERSAL Form Clamps
McKERNAN-TERRY Pile Hammers, etc.
NOVO Engines, Hoists Tools
CONNERY Asphalt Kettles
WYOMING Shovels, Picks
Member: Associated Equipment Distributors

EARNEST BROS.

14 N. 7th Street Richmond, Va.

Representing

H. E. C. KOEHRING—Mixers, Pavers, Shovels, Mud Jack, Sub-grade Planer
T. L. SMITH CO.—Mixers, Pavers, Truck Mixers
C. H. & E.—Saw Rigs, Pumps, Hoists, Mortar Mixers, Material Elevators, 6" Ditcher
INSLEY—Shovels, Cranes, Concrete Plants, Towers, Buckets, Derricks
JOHNSON—Steel Bins, Batchers, Bulk Cement Plants, Ready Mix Plants
OWEN—Clamshell Buckets, Rehandling and Digging
DOW—Calcium Chloride
PORTABLE POWER TOOL CORP.—Hand Electric Saws and Drills

J. W. BARTHOLOW COMPANY

Machinery, Contractors' Equipment, Supplies

1221 So. Lamar St. Dallas, Texas

RANSOME Mixers, Chutes
CLYDE Hoists and Derricks
BLYSTONE Plaster Mixer
DOMESTIC Pumps
WYOMING Shovels, Picks
GENERAL Wheelbarrows
WIARD Plows
CYCLONE Drills
SULLIVAN Air Compressors
McKERNAN-TERRY Pile Hammers
FARQUHAR Boilers

ROOS Shores
NORTHWEST Cranes
BLAW-KNOX Buckets
RANSOME Pavers
ORD Concrete Finishers
ACME Rollers, Graders
KOPPEL Cars
MUNDY Home Equipment
BLAW-KNOX Bins, Forms
TELSMITH Crushers, Etc.
AUSTIN Ditchers
BAY CITY Truck Cranes, Backfillers

F. W. GARTNER COMPANY

1010 Milby Street Houston, Texas

Contractors Equipment

RANSOME Mixers & Pavers
PAGE Dragline Buckets
HAYWOOD Clamshell Buckets
ACME Road Rollers, Graders
ACME Crushers
CLIMAX Gasoline Engines
LE RAY Gasoline Engines
ROGERS Trailers
DODGE Derricks
MACLEOD Kettles
BAY CITY Truck Cranes

THE C. H. JONES COMPANY

Construction and Industrial Equipment

134-140 Pierpont Ave. Salt Lake City, Utah

Representing

JAEGER MACHINE CO.—Concrete Mixers, Hoists & Pumps
GALION IRON WORKS & MFG. CO.—Road Graders and Rollers
BAY CITY SHOVELS, INC.—Power Shovels, Draglines and Cranes
OHIO POWER SHOVEL CO.—Lime "101" Shovels, Draglines and Cranes
DIAMOND IRON WORKS, INC.—Gravel Crushing and Screening Plants
THE FOOTE CO., INC.—Multifoot Paving Mixers
LINK BELT CO.—Elevating and Conveying Machinery
CLEVELAND TRACTOR CO.—Cletrac Crawler Tractors
CHICAGO AUTOMATIC CONVEYOR CO.—Portable Belt and Drag Conveyors
BAKER MFG. CO.—Truck and Tractor Snow Plows

PHILLIPS MACHINERY CO.
900 East Cary St. Richmond, Va.
Representing
BANSOME CONCRETE MACHINERY CO.
CLYDE SALES CO.
DEWALT PRODUCTS CORP.
HARNISCHFEGER SALES CORP.
ERIE STEEL CONSTRUCTION CO.
SAUERMAN BROTHERS, INC.
CHICAGO PNEUMATIC TOOL CO.
DRAVO EQUIPMENT CO.
STEPHENS-ADAMSON MFG. CO.
METAFORMS CORPORATION
ROGERS BROTHERS CORP.
GENERAL EXCAVATOR CO.
AERO BURNER CO.
BARNES MANUFACTURING CO.
MANITOWOC ENGINEERING WORKS
BRODERICK & BASCOM ROPE CO.
Also many other lines of Contractors' Equipment

VIRGINIA TRACTOR CO., Inc.

916 North Boulevard Richmond, Va.

Dealers in Equipment, Attachments
and Implements for use with

“CATERPILLAR” Tractors
“CATERPILLAR” Graders
“CATERPILLAR” Combines

CONSTRUCTION EQUIPMENT CO.

1118-1124 Ide Ave., Spokane, Wash.

Archer Iron Works
Beede Bros.
Blyatons Mfg. Co.
Broderick & Bascom Rope Co.
Buffalo-Springfield Roller Co.
Butler Bin Co.
Chain Belt Co.
D-A Lubricant Co.
Detroit Graphite Co.
DeWalt Products Co.
Elgin Sales Corp.
Fate-Roof-Heath Co.
Climax Eng. Co.
Ideal Power Laws Mower Co.
Le Ro Co.
Linde Air Products Co.
Fairbanks, Morse & Co.
Member: Associated Equipment Distributors

M. & M. Wire Clamp Co.
Niagara Mfg. Co.
Novo Engine Co.
St. Regis Paper Co.
Sanger Derrick Co.
Sheldon Mfg. Co.
Speeder Machy. Corp.
Sterling Wheelbarrow Co.
Sullivan Machinery Co.
Sunbeam Mfg. Co.
Templeton, Kenly Co.
Kalamazoo Railway Supply Co.
Williams Buckets & Trailers
Williamson-Ersted Co.
Wyoming Shovel Works
Young Iron Works

JOS. S. POTTS, JR. COMPANY

Factory Sales Engineers

Travelers Bldg. Richmond, Va.
Representing

Bucyrus-Erie Co. Boston Woven Hose &
McKenna-Terry Corp. Rubber Co.
Deister Concentrator Sprague Electric Hoists
Co. Div.
National Wire Cloth Co. Trailor Engrg. & Mfg.
Williams Buckets and Co.
Trailers

A. Leschen & Sons Rope Co.

and other leading manufacturers

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location you fail to send us your new ad-
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copy of the magazine to you on time do
not put off writing us. Thank you.

**CONTRACTORS AND ENGINEERS
MONTHLY**

470 Fourth Ave. New York

GENERAL MACHINERY CO.

East 3500 Block Riverside Avenue
Spokane Washington

Representing

Ohio Power Shovel Co.
General Excavator Co.
Bay City Shovels, Inc.
Smith Engineering Works
Jaeger Machine Co.
Superior Engine Co.
Hercules Motors Corp.
DeLaval Steam Turbines Co.
General Electric Co.
John A. Roebling's Sons' Co.
Cleveland Wheelbarrow Co.
Midwest Locomotive Works

**RICHMOND MACHINERY
& EQUIP. CO.**

Broadway Bank & Trust Bldg. Richmond, Va.

Representing

J. J. Case Co.
Cleveland Rock Drill Co.
Connery and Co.
Construction Machinery Co.
Galloway Works and Manufacturing Co.
Good Roads Machinery Co.
Manitowoc Engineering Works
Mead-Morrison Manufacturing Co.
Page Steel and Wire Co.
Schramm Incorporated
Virginia Metal Manufacturing Co.
A. B. Farquhar Co., Ltd.

Southern Machinery & Supply Co.

Roanoke Virginia

“All Kinds of Machinery”

Austin-Western Road Littleford Bros.
Machinery Co. Cleveland Tractor Co.
The Osgood Co. Linn Manufacturing
Vulcan Iron Works Corp.
Chain Belt Co. Grindler Crusher &
The Novo Engine Co. Pulv. Co.
Austin Machinery Corp. Columbus Conveyor
George Haiss Manufac- turing Co.
turing Co.
Heitzel Steel Form & Power Manufacturing
Iron Co. Gardner-Denver Co.
Contractors' Equipment in Stock in our
Roanoke Warehouse

HOFIUS-FERRIS EQUIPMENT CO.

728-802 Mallon Avenue

Spokane Washington

Road Building, Logging and Power
Farming Equipment

Representing

CATERPILLAR TRACTOR CO.
Tractors — Graders — Harvesters

SHOP — SERVICE

SMITH-COURTNEY COMPANY

7th & Bainbridge Sts. Richmond, Va.

Representing

JAEGER—Mixers, Hoists and Pumps
WORTHINGTON—Air Compressors
BROWNING—Cranes and Shovels
CLEVELAND—Rock Drills
HOMELITE—Portable Pumps
CYCLONE—Road Guard
LAKEWOOD—Towers and Paving Equipment
SKILSAW—Electric Saws
BEEBE—All Steel Hand Hoists
Complete Stock of Contractors' Supplies
and Accessories

GEIJSBEEK ENGINEERING CO.
Arctic Building Seattle, Wash.

Representing

HANSON Excavators
FATE-FOOT-HEATH Crushers
EAGLE Sand and Gravel Plants
HARDINGE Grinding Mills
NORTH AMERICAN REFRAC-
TORIES CO.—Fire Brick
Pumps, Compressors, Drilling Tools
Contractors' Scientific Instruments

Bluefield Supply Company

Bluefield W. Va.

Representing

Blaw-Knox Co. Goodyear Rubber Co.
Ingersoll-Rand Co. E. I. DuPont de Nemours & Co.
National Equip. Corp. Williamsport Wire Co.
Novo Engine Co. Johns-Manville Corp. Rope Co.
Cleveland Tractor Co. General Electric Co.
American Saw Mill Brookville Locomotive
Machy. Co. Co., Ltd.

Authorized Waukesha Service

WE DO NOT CHOOSE TO RUN—

anything in this Directory that is
not accurate and up-to-date. Therefore,
if you find any errors or cor-
rections we hope you will let us
know about them. Thank you.

**CONTRACTORS AND ENGINEERS
MONTHLY**

470 Fourth Ave. New York

PACIFIC HOIST & DERRICK CO.

Machinery and Equipment

3200 4th St. Seattle, Wash.

Representing

NORTHWEST—Gas and Electric Shovels.
Oranes and Draglines
BUHL—Air Compressors
TWIN DISC—Clutches for all purposes
PAGE—Scrapers, Buckets, Diesel Draglines
MINNEAPOLIS—“Twin City” Gas Engines
CLIMAX—Gasoline Engines
WISCONSIN—Gasoline Engines
MIDWEST—Locomotives
DAKE ENGINE CO.
PIONEER—Gravel Equipment
ISAACSON IRON WORKS—Buckets
Member: Associated Equipment Distributors

GENERAL EQUIPMENT CO., Inc.

414 No. Fourth St. Clarksburg, W. Va.

Representing

CATERPILLAR TRACTOR CO.—Tractors, Graders
DETROIT HARVESTER CO.—Street Sweepers, Mowers
KILLEFER MFG. CORP.—Plows and Discs
HUBER MFG. CO.—Gasoline Rollers
ATHHEY TRUSS WHEEL CO.—Crawler Wagons
GARDNER-DENVER CO.—Compressors and Jackhammers
STERLING WHEELBARROW CO.—Wheelbarrows
BLAW-KNOX CO.—Road Forms, Batchers, Bins, etc.
LA PLANT-CHOATE MFG. CO.—Bulldozers, Snow Plows
AMERICAN CABLE CO.—Tru-Lay Ropes
BURCH CORP.—Conveyors, Car Unloaders and Spreaders
NORTHWEST ENGINEERING CO.—Gasoline Shovels
BARNES MFG. CO.—Pumps
JAEGER MACHINE CO.—Concrete Mixers
HERCULES POWDER CO.—Explosives & Blasting Supplies
EUCLID ROAD MACHY CO.—Earth Moving Equipment
DAY—Crushers

DIRECTORY OF DISTRIBUTORS

WEST VIRGINIA—WYOMING

BAILEY-TRENN MACHINERY CO.
20th St. & B. & O. R. R. Huntington, W. Va.
Caterpillar Tractor Co.
Athey Truss Wheel Co.
Allsteel Products Mfg. Co.
LaPlant-Choate Mfg. Co.
Northwest Engineering Co.
Euclid Road Machinery Co.
Detroit Harvester Co.
Williamette-Ersted Co.
Gardner-Denver Co.
Huber Roller Co.
W.H.M. Co., Inc.
Heltzel Steel Form & Iron Co.
Universal Crusher Co.
Burch Corp.
Foote Co.
American Tractor Equip. Co.
Davey Compressor Co.

THE PORTER SUPPLY CO.
P. O. Box 736 Huntington, W. Va.

Representing
BUCHYRUS-ERIE CO.—Steam, Gas and Diesel Shovels
ALLIS-CHALMERS
Tractors
J. D. ADAMS CO.—Graders
THE HUG CO.—Dump Trucks
SULLIVAN—Compressors
Tools
DOMESTIC Pumps and Hoists
BLAW-KNOX Bins, Batchers and Forms
A. W. FRENCH CO.—Finishing Machines
CONNERY Asphalt Heaters
GOODALL Rubber Hose
BUFFALO-SPRINGFIELD
Rollers
GEO. D. WHITCOMB Locomotives
WESTERN Dump Cars
HAZARD Wire Rope
M-W Lubricants
W. K. M. COMPANY INC.
NATIONAL CARBON CO.
Graphite Grease

BOEHCK EQUIPMENT COMPANY
2404 W. Clybourn St., Milwaukee, Wis.

Representing

Barber-Green Company
Byers Machine Company
Jaeger Machine Company
LeRoi-Rix Air Compressors
A. Stroh & Brothers Co.
Williams Buckets & Trailers
Kerner Automatic Hoist Co.
McKinnan-Terry Corp.
Huber Mfg. Company
W. Toepper & Sons Co.
Symone Clamp & Mfg. Co.
J. P. Curry Mfg. Company
Jones Superior Machine Co.
Sassgen Derrick Company
Aarow Burner Co., Inc.
Fairbanks, Morse & Co., Inc.
Universal Form Clamp Co.
Moloch Foundry & Mach. Co.
J. S. Mundy Hoisting Engine Co.

ENGINEERS AND CONTRACTORS SUPPLY COMPANY

West Allis Wisconsin

Representing

Austin Machinery Corporation
Browning Crane & Shovel Co.
Remmel Concrete Mixer Co.
Belmont Packing & Rubber Co.
Whiting Leather & Belting Co.

Complete line of Concrete Product Equipment.
Block, Brick and Tile Machines.

T. W. MEIKLEJOHN CO.
520 No. Main St. Fond du Lac, Wis.

Representing

Speeder Machinery Corp.
W. A. Riddell Co.
Saueran Bros., Inc.
Wehr Co.
Trackson Co.
Willamette-Ersted Co.
Fordson Distributor in Wisconsin, Illinois, Iowa, Indiana and Michigan

CUNNINGHAM-ORTMAYER CO.
429 W. Michigan St. Milwaukee, Wis.

Distributors

BUTLER—Bins and Measuring Devices
CAREY—Elastite Joints and Building Materials
G. H. & E. Pumps, Hoists and Saw Rigs
CONCRETE ENGR. CO.—Reinforcing Steel
DOWFELAKE—Calcium Chloride
DAVENPORT—Sheepfoot Rollers and Snow Plows
INGERSOLL-RAND—Compressors, Concr. Breakers, Diggers
LAKWOOD—Road Finishers, Subbraders, Chuting Equip.
LITTLEFORD—Road and Street Maintenance Equipment
KOENIGER—Screws, Pavers, Dumpsters and Mud Jacks
PARSONS—Ditchers and Trenchers
SERVICE—Hand Shovels, Scops and Spades
SMITH, T. L.—Pavers and Mixers
STERLING—Wheelbarrows
STFCOTE—Waterproof Paper
WEHR—Rollers, Power Graders
WILLIAMS—Form Clamps and Accessories
Member: Associated Equipment Distributors

HUNTER MACHINERY COMPANY

327 So. 16th St. 627 E. Mifflin St.
Milwaukee, Wis. Madison, Wis.

ARCHER Towers
BATES Wire Ties
BLAW-KNOX Bins, Forms
CHAIN BELT Mixers, Pavers
Pumps, Truck Mixers,
Saw Rigs
CLYDE Hoists, Derricks
HOMELITE Pumps
LESCHEN Wire Rope
“CATERPILLAR” Dealers for Southern Wisconsin

Trackson Company
Euclid Road Machy. Co.
Blaw-Knox Atco Div.
LaPlant-Choate Mfg. Co.

Member: Associated Equipment Distributors

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CONTRACTORS AND ENGINEERS MONTHLY
470 Fourth Ave. New York

DROTT TRACTOR CO., INC.
3841 Wisconsin Avenue

Wisconsin
Milwaukee
Representing in the State of Wisconsin and Upper Peninsula of Michigan:
ALLIS-CHALMERS — Industrial and Track Type Tractors, Power Operated Elevating and Blade Graders, Motor Patrol Graders, Track Type Wagons
PIONEER—Gravel Equip.
DROTT—Bulldozers and Scrappers
WAUSAU—Snow Plows
TWO-WAY-DRIVE—Super Trucks
DAVEY Air Compressors
KINNEY Road Oilers
TORO Highway Mowers
HERCULES Road Rollers
HIGHWAY Trailers
CLEVELAND Rock Drills
WILLETT Truck Blades
HANDY SANDY Sand
SPREADERS
SHAW ENOCHS Pull Type Graders

ROBERT T. TWEDT CO., INC.
15th St. and Pioneer Ave. Cheyenne, Wyo.

Representing
“CATERPILLAR” Tractors and Graders
LaPlant-Choate Snow Removal and Dirt Moving Equipment
KILLEFER Scrapers, Fresnos & Road Rippers
ATHLET Truss Wheel Wagons
EUCLID Road Machinery
MACWHYTE Wire Rope
OIL FIELD Hoists and Equipment
GOOD ROADS Champion Sand & Gravel Equip.
WIARD Road Plows
WAUSAU Bulldozers, Snow Plows and Back Fillers
SPEEDER Draglines and Shovels
MASTER Loaders and Rotary Scrapers
DETROIT Mowers, Sweepers & Snow Brushes
WILLIAMS Buckets and Heavy Duty Trailers

Three Lists Worth Consulting:

Valuable Catalogs for Contractors	•	•	•	pages 43 and 44
Equipment Distributors' Directory	•	•	•	pages 50 to 69
Engineers' Directory	•	•	•	pages 46 to 49

If you don't find what you want in these lists, write us.

CONTRACTORS AND ENGINEERS MONTHLY

470 FOURTH AVENUE

NEW YORK

CANADA

Alberta
British Columbia
Manitoba
Ontario
Quebec
Saskatchewan

FERGUSON SUPPLY CO., Ltd.
CALGARY

Representing

Northwest Engineering Co.
Page Engineering Co.
B. Greening Wire Co., Ltd.
London Concrete Mch. Co., Ltd.
Iowa Mfg. Co.
Herbert Morris Crane & Hoist Co., Ltd.
Worthington Pump & Mch. Corp.
Tempiston, Kenly & Co., Ltd.
Federal Belting & Asbestos Co., Ltd.
Moon Manufacturing Co.
Factory Equipment Ltd.
J. L. Goodhue & Co., Ltd.
Jeffrey Manufacturing Co.
Canadian Hoists & Conveyors, Ltd.
Dominion Ed. Mch. Co., Ltd.

KIPP-KELLY, Ltd.
68 Higgins Ave. Winnipeg, Manitoba

Representing

GARDNER-DENVER — Air Compressors, Tools
KELLER Pneumatic Riveters, Calkers, Drills
LUDGERWOOD — Hoists, Derricks, Excavators, etc.
ORENSTEIN & KOPPEL — All Types Industrial Cars
PETERS — Oil Engines and Generating Sets
WHITCOMB — Gasoline, Oil, Electric Locomotives
MORRIS — Cranes, Hoists, Blocks, Crane Trucks
—REPAIR PARTS AND SERVICE SHOPS—

JUST EQUIPMENT & SUPPLY CO., Ltd.

173 Colborne Street Montreal, Que., Canada

Athey Truss Wheel Co.
Buffalo-Springfield Roller Co.
Caterpillar Tractor Co.
E. D. Etnyre & Company
Hi-Way Service Corp.
AllSteel Products Mfg. Co.
LaPlant-Choate Mfg. Co.
National Steel Car Corp., Ltd.
National Equipment Corp.
Koehring Div., Parsons Div., Kwick-Mix Div.
Schramm, Inc.
American Tractor Equip.
Lanham Wagon Co.
Handsco Wonder Drill Co.
Northern Conveyor & Mfg. Co.
Pittsburgh-Des Moines Co.
of Canada, Ltd.

Killefer Mfg. Co.
Detroit Harvester Co.
Willamette-Ersted Co.
Master Equipment Co.
Brookville Locomotive Co.
Sanford Day Iron Works
Miami Tractor-Scraper Co.
The W. K. M. Company
The Buda Company
Highway Trailer Co.
Pioneer Gravel Ex. Mfg. Co.
Contractors Mach. Corp.
Blaw-Knox Company
Inslay Manufacturing Co.
Euclid Road Machy. Co.
C. H. & E. Mfg. Co.
Ward Plow Company
Wood Hydr. Hoist & Body Co.

FERGUSON SUPPLY CO., Ltd.
ALBERTA

Representing

Northwest Engineering Co.
Page Engineering Co.
B. Greening Wire Co., Ltd.
London Concrete Mch. Co., Ltd.
Iowa Mfg. Co.
Herbert Morris Crane & Hoist Co., Ltd.
Worthington Pump & Mch. Corp.
Tempiston, Kenly & Co., Ltd.
Federal Belting & Asbestos Co., Ltd.
Moon Manufacturing Co.
Factory Equipment Ltd.
J. L. Goodhue & Co., Ltd.
Jeffrey Manufacturing Co.
Canadian Hoists & Conveyors, Ltd.
Dominion Ed. Mch. Co., Ltd.

LONDON CONCRETE MACHY. CO.
Limited

CANADA

Representing

ARCHER Tower Hoist Equipment
BLACKMER Pumps
CONSOLIDATED Concrete Machinery
FOOTE Pavers
NOVO Gasoline Engines
Concrete Mixers—Tilting and Non-Tilting
Concrete Block Machines
Cement Brick Machines
Hoisting Engines
Centrifugal, Diaphragm and Rotary Pumps
EVERYTHING FOR THE CONTRACTOR

WE WOULD LIKE TO
HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Avenue New York

BROWN, FRASER & CO. Ltd.
Vancouver British Columbia, Can.

Representing

BAY CITY Shovels and Cranes
CASEY JONES Speeders
CEDAR RAPIDS Gravels Plants, Crushers
CLETRAC Tractors
GALION Road Machinery
HAISS Mechanical Loaders and Excavators
HERCULES Engines and Power Units
HUMDINGER Pumps
PLYMOUTH Gas and Diesel Locomotives
SAUERMAN Scrapers and Excavators

CANADIAN EQUIPMENT
CO., LIMITED

1111 Beaver Hall Hill Montreal, P. Q., Can.

Representing

Industrial Brownhoist Corp.
Orr & Sambower, Inc.
Barnes Manufacturing Co.
Cleveland Tractor Co.
Trink Snow Plows
Rotary Snow Plows
Austin Manufacturing Co.
Butler Bus. Co.
Hercules Motors Corp.
New England Road Machy. Co.
Gardner-Denver Co.
Marion Steam Shovel Co.

THE ALBERT OLSON CO. LTD.

1148-50 Osler Street
REGINA SASKATCHEWAN CANADA

Representing

“CATERPILLAR” Tractors
“CATERPILLAR” Road Equipment
“CATERPILLAR” Combined Harvesters
TONCAB Metal Culverts
PIONEER Gravel Equipment
LENHART Dump Wagons
LA PLANT-CHOATE Equipment
KILLEFER Scrapers
EUCLID Equipment
P. & H. Shovels and Cranes

MORRISON TRACTOR &
EQUIPMENT CO. Ltd.

940 Station St. Vancouver, B. C.

BRITISH COLUMBIA DISTRIBUTORS FOR

Caterpillar Tractor Co.
Tractors—Graders—Combines
Pioneer Gravel Equipment Mfg. Co.
American Tractor Equip. Co.
LaPlant-Choate Mfg. Co.
Athey Truss Wheel Co.
Killefer Mfg. Corp.
Rotary Snow Plow Co.
Detroit Harvester Co.
Day Pulverizer Co.

GENERAL CONSTRUCTION
MATERIAL CO., LTD.

1194 Stanley St. Montreal, P. Q.

Sole Agents in Quebec Province
BAY CITY—Electric and Gasoline Shovels

“A. W.”—Traffic Treads for Bridges

“BOLSVAY” Calcium Chloride

MARMON-HERRINGTON—Four-wheel and Six-wheel

drive Trucks

DIAMOND—Sand & Gravel Equipment, etc.

DYER—Welding Machines—Electric

FREEMAN—Truck Turntables

Montreal, P. Q.

GALION—Road Machinery
SHUNK—Graders and Drag Blades, etc.

STERLING—Hoists and Air Compressors

SHAW—ENOCHS—Pull-Type Power Graders and Maintainers

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